226

ANNUAL REPORT OF THE MEDICAL DEPARTMENT

COLONY OF SINGAPORE

1947

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ANNUAL REPORT OF THE MEDICAL DEPARTMENT

COLONY OF SINGAPORE

1947

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ANNUAL REPORT OF THE MEDICAL DEPARTMENT, COLONY OF SINGAPORE, 1947

PART I

INTRODUCTORY

The Colony of Singapore consists of Singapore Island with a number of adjacent islands, including Christmas Island and the Cocos Keeling Islands in the Indian Ocean. It came into being under the constitutional proposals instituted on 1st April, 1946.

The climate of Singapore is relatively good in spite of a close proximity to the equator. It is characterised by a uniform temperature of 80° to 90° F. and a high average humidity of 84%. The island is flat without hills of any consequence. While there is no real dry season the rainfall is considerably increased during the North East Winter Monsoon. The average annual rainfall is within the hundred inch range.

While the 1946 Report of the Medical Department was the first ever issued on the new Island Colony, the present one is the first to cover a complete year under the Civil Government. Prior to 1st April, 1946, the Colony was under the control of a British Military Administration from the date of the liberation after the Japanese Occupation in September, 1945. The 1946 Report included a brief review of the enemy Occupation in addition to a comment on the pre-war position and a statement on the Military Administrative period. It is hoped to present a continuous picture in these reports in a reasonably readable form over a very difficult but interesting stage of development.

The Military Administration extended from September, 1945 to April, 1946 and was a term of hectic improvisation: April to December 1946 represented a season of urgent rehabilitation as pre-war medical institutions became available to the civil authority: 1947 may be referred to as a period of planning and continued rehabilitation. While Singapore as a part of a general Malayan Administration had under consideration medical modernisation plans of various kinds prior to the war, they were never implemented because of it. Such planning was urgent then. How much more so after a further eight years—almost four of them under the occupation of an enemy impervious to modern medical progress.

The Hospital Service has been brought up to within measurable distance of the pre-war bed strength and the medical care of the public compares favourably with that of any previous decade. That this has been achieved in spite of a smaller available staff, particularly nursing staff, is a tribute to the existing personnel and organisation.

By restricting the recovery period wherever possible, an increased turnover in the wards has been achieved. The general public is being given an increased service in many other ways: thus almost four times the pre-war number of outpatients is now being dealt with. Tuberculosis is given five times the number of beds placed at the disposal of this disease before the war: V. D. treatment in women is well over the 1940 level. As the General Hospital has only half the number of nurses required to bring the whole institution into operation, and as there is insufficient accommodation to house the existing staff, it is obvious that no further increase in general medical admissions will be possible until conditions have been made compatible with the recruitment of a larger staff. While adequate renumeration is a matter of present consideration by the Government, staff accommodation is part of the Medical Plan and has been given priority in it. Staff quarters were designed in 1940 as an urgent matter: nothing has been accomplished so far. Excluding mental disease and leprosy, only one fifth of the bed strength required is available today: there is no proper outpatient accommodation. These are only some of the difficulties to be faced in our medical task.

The Health Division faced a formidable work in keeping up a Rural Welfare Service in temporary buildings and even more primitive structures, and in meeting the demands of a rapidly expanding sea and air port control. That so much has been achieved in the former direction is a tribute to the continued devotion to duty of Miss I. M. M. Simmons, M.B.E., the retiring Public Health Matron.

Singapore is well on its way to becoming one of the major sea and air ports of the world. Shipping tonnage from infected ports expanded from two and a half million total in 1946 to four and a half million in 1947: over 13,000 civilian air passengers from infected ports passed through the airports during the year. While the School Medical Service has reached its pre-war level of efficiency, this is a totally inadequate organisation for the medical programme as planned at present. It just cannot cope with the requirements of present school health. In all the talk that has gone on in regard to tuberculosis this disease in children seems to have been largely overlooked. It is in this connection that the most urgent action is called for. No dental service for schools has ever been in operation. Thus these problems received the most anxious consideration with a view to essential expansion in 1948.

One good step forward was made in the way of school health during the year and that was the institution of a child feeding scheme for the pre-school child, under the auspices of the Social Welfare Department. When it is noted that nothing has ever been done for this vital section of the population the significance of this achievement cannot be exaggerated.

Under such adverse medical working conditions it is a relief to be able to record a continued improvement in the general public health. This report will show that while intensive efforts have resulted in such improvement much remains to be done if this health is not to deteriorate rapidly and with disastrous effect on the communal life of the people. A vital nerve centre of South East Asia such as the Colony of Singapore cannot stand still and rely indefinitely on a totally inadequate and outmoded medical service. The Vital Statistics section will indicate the present satisfactory picture as compared with the past (lowest recorded infant mortality rate: death rate: maternal morbidity rate). The quarantine service undoubtedly played its part in maintaining our port as one of the healthiest in the East. One has the uneasy feeling, however, that these results may lead to a quite unwarranted sense of false security. Statistics so far available cannot indicate the serious amount of latent ill-health, particularly in the child population, following the Occupation. An overworked service capable of dealing satisfactorily with certainly not more than half a million people cannot cope satisfactorily with double that number under the best of conditions. Here we have an Island Colony of some 269 square miles in area, 27 miles in length and 14 miles in breadth, with a census population of 938,000 people. There is nothing primitive about the majority: a medical culture appropriate to the highest standards of civilization is demanded. What was good enough in the pre-war decade is no longer so—a fact which is evidenced by the agitation regarding the accommodation provided at the Quarantine Station.

So far, the medical staff has had its hands full in keeping a small and inadequate service on its feet and the necessary and urgent expansion required will be a full time job for any additional staff which can be obtained in the near future. The pity is that there is no time to think and study properly under existing conditions. Problems for study are crying out for attention: to be satisfactory a medical staff requires time for things other than pure routine if it is to furnish a willing service. So serious did the staffing position become during one period that steps had to be taken to recruit housemen from the United Kingdom on a short term contract basis. This action undoubtedly saved the public from a serious curtailment of medical service.

Early in the year a comprehensive and detailed Medical Plan for the Colony was drawn up on a five year basis. Financial consideration soon indicated that progress at such a speed would be impracticable. So the Plan has been modified on a ten to fifteen year span; as it is felt to be such a moderate one in view of Singapore's requirements, ten years is suggested as the reasonable completion period. Western medicine is in increasing demand: it is impossible to meet this with our present facilities.

The Government Medical Services cover the entire hospital organisation of the Colony except the Infectious Diseases Hospital, which is under a form of joint Municipal and Government administration, all air and sea quarantine arrangements, the rural health division (some 250,000 persons) and the school medical services. These are controlled by a Director of Medical Services with a Chief Health Officer and a Chief Medical Officer.

The Director was an ex-officio President of the Council of the College of Medicine; President of the Medical Council of the Colony of Singapore and the Malayan Union; Registrar of the Medical Council; Chairman of the Dental Board; Chairman of the Hospitals Board; Chairman of the Pharmacy Board; Chairman of the Public Health Conference and Chairman of St. John's Ambulance Association Working Committee. He was also a member of the Advisory Council of the Colony until he went on leave.

Christmas Island is situated in the Indian Ocean. It is a densely wooded area of some 60 sq. miles. The population is merely a few hundred Chinese and Malays who work in exporting the deposits of phosphate of lime found on the Island under the management of the Christmas Island Phosphate Co., Ltd. There is a medical officer and a small, well equipped hospital.

The Cocos-Keeling Islands consist of some 27 coral reefs, only two of which have any practical significance. One is used by the Cable and Wireless Company as a station and the other by the labourers and their families working the large coconut plantations on the Islands. The latter is unique in that the population is self contained and immune to outside interference. In consequence it offers the possibility of an interesting sociological and medical study of which it is hoped advantage will be taken in the not too distant future: this is desirable in view of the fact that this small community shows signs of minor food deficiency disease due to lack of vegetable and fruit consumption and anaemia from worm infestation. A medical officer is available.

PART II

ADMINISTRATION AND LEGISLATION

Administration: Officers of the Malayan Medical Service fill the higher posts in the medical and public health services of Singapore. Appointments to the staff of King Edward VII College of Medicine are also made from this service. Discussions on a unified scheme have been instituted whereby all medical practitioners with a registrable qualification will become eligible for one service as distinct from the present position of a Malayan Medical Service and a local Medical Service, the members of which can obtain promotion to the former.

Matrons and nursing sisters for hospital and public health posts are usually recruited from the Overseas Nursing Association but during the year eight promotions to sisters were made from the local Nursing Service and this policy will be increasingly followed in future. In addition, there is a large number of locally trained staff nurses, nurses and probationers, hospital and laboratory assistants employed in the various hospitals. Sanitary Inspectors who have attended the Sanitary Inspector's course in Singapore and have passed the local examination of the Royal Sanitary Institute, London, are also appointed. A summary of officers authorised and available on 31st December, 1947, will be found in Appendix *I*.

Staffing Position: The seriousness of the staffing position can hardly be expressed in figures. The authorised staff has not been increased to any appreciable extent over the pre-war strength although the demands on the department are such that even if there was the full complement laid down in the estimates the work could not be adequately performed as there is an increasing demand from the local staff for study abroad. Scholarships of various kinds are awarded in order to encourage officers who wish to improve their qualifications. If this natural request is to be adequately met more staff is essential for this purpose, apart from the necessity of dealing with very considerable increases in routine work of all kinds.

The situation in the Dental and Health Divisions is a sufficient example of the actual position. Three dental surgeons are shown in the estimates. It must be clear even to the uninitiated that such a small staff is providing nothing more than a token service. Yet it has not been an easy matter to increase its strength from three to four. The Health Division has only 7 permanent medical staff out of an authorised total of 19.

During the year the existing deficiencies, particularly in local staff, were met by a number of short-term housemen on the medical side and by temporary officers, including married women, on the health side. Without these the Department would have been unable to meet its commitments. There has been criticism that these appointments were not filled by local graduates and in clarification of this issue it must be explained that only thirteen graduates were available in Singapore and the Federation combined during the year of whom less than half were prepared to accept the terms of service prevailing. As the Medical Department is run for the benefit of the public, junior members must be prepared to perform the duties assigned to them however dull and uninteresting some of these may appear to be. Inexperienced officers are of little value to the public service and duties must be varied to cover a wide field. Personnel is required to cover the Federation as well as Singapore.

The shortage in medical staff was particularly felt in certain specialist branches such as Public Health. There are not likely to be permanent officers for these posts for a very considerable time to come. Thus temporary officers of either sex were welcomed in this Division and will continue to be welcomed. Health work requires special experience and qualifications. Unfortunately it does not appear to be popular with the local graduates.

The most acute shortage was in the trained nurses field and in specialist sisters. The establishment is some 300 hospital nurses and it will be impossible to increase this ludicrously small number until the present deficiencies are made up. Of the 225 nurses available at the end of the year only 108 were fully trained. Seven local nurses were promoted to ward sisters and although the idea is to augment this number the process will have to be a slow one as only a few are as yet capable of taking advantage of the responsible duties entailed. On the arrival of the Sister Tutor action commenced on the complete revision of the curriculum and training syllabus. Our nurses are anxious to have a scheme reciprocal with the United Kingdom and to have the local diploma recognised by the Home Authority. An investigatory committee was about to be formed for this purposes as the year ended. Male nurses or hospital assistants play an increasingly important part in the hospital system in view of this shortage in females, but a reasonable balance must be struck if the Department is to function properly.

A particularly distressing feature has been the unwilling co-operation of a section of the hospital servants' contingent. While fortunately no strike actually occurred and no serious disturbance in the medical services resulted as in 1946, action of this nature was threatened on more than one occasion. The Directorate kept in touch with the representatives of the Singapore Medical Labour Union and it is hoped to avoid a serious rupture by this means and the continued assistance of the Labour Department of Government.

Quarters for staff is a matter of urgent priority. There was a grave shortage in this direction in 1941 and a seven years interval has greatly aggravated the situation, in addition to the fact that what was considered suitable before the war in this respect will no longer be tolerated. An advancement in the public medical services is held up almost as much by this factor as by actual shortage in personnel.

Legislation: Legislation enacted during the year provided for emergency measures against the introduction of cholera. Ordinances regulating ship fumigation with hydrogen cyanide, rural building and the sale of food and drugs were also passed. This legislation is detailed in Appendix *II.*

PART III

VITAL STATISTICS

Population: One of the most important events of the year was the publication of the preliminary figures from the census enumeration which recorded a total population figure approaching the million mark. The forecasts and figures in the Statistical Review of 1946 have been found to have been surprisingly accurate in view of the paucity of reliable information then available. The Japanese enumeration in 1944 gave a return of 860,000. At the 1931 census—the last recorded—the total was only 557,745.

Census Year	Chinese	Malays	Indians	Europeans	Eurasians	Others	Total
1911 ..	219,577	41,806	27,755	not	available	..	303,321
1921 ..	315,151	53,595	32,314	6,145	5,436	5,717	418,358
1931 ..	418,640	65,014	50,811	8,082	6,903	8,295	557,745
1947 ..	727,863	114,654	71,289	8,718	9,012	6,543	938,079

Thus the population of Singapore Island has increased by some 68% over the last sixteen years as compared with a 33% increase between the 1921 and 1931 census periods and 38% between 1911 and 1921. While there was a very considerable immigration from India and China over the 1911 to 1931 decades which accounted for a large part of the population increase this factor greatly diminished after the latter year and was of course non-existent during the war. Thus the remarkable growth in the size of the Colony over this span has to be sought elsewhere and undoubtedly a greater natural increase must be held to play an increasingly important part, a factor which has been stressed in the press recently (Straits Times, January 14, 1948). The change in the sex ratio appears to support this view:—

Year	*Males*	*Females*	*Females per 1,000 males (approx.)*
1911	215,489	87,832	408
1921	280,918	137,440	489
1931	352,167	205,578	584
1947	515,814	422,265	819

CHRISTMAS AND COCOS-KEELING ISLANDS

1947 Census: 2,634 (females 1,121)

Race	*Christmas Island*	*Cocos Island*	*Total*
Malays	32	1,778	1,810
Other Malayasians	99	2	101
Chinese	621	14	635
Indians	11	—	11
Europeans	55	17	72
Eurasians	—	—	—
Others	5	—	5
Population	823	1,811	2,634
Births	65	96	161
Deaths	4	20	24

While a study of the figures for each of the main communities shows a similar racial distribution in the population in the last two census enumerations these clearly indicate a considerable increase in the proportion of Chinese as compared with all other races.

Year	Chinese	% of total	Malays	% of total	Indians	% of total
1931	418,640	75·1	65,014	11·7	50,811	9·1
1947	727,863	77·6	114,654	12·2	71,289	7 6

This increase in the population of over 68% over the last 16 years indicates the size of the housing and health problems which face the Colony. These would be serious enough if the present housing was up-to-date and sanitary: if the services were adequate. As a large proportion is living in old and quite unsuitable quarters and the hospital facilities are only capable of dealing satisfactorily with a population a quarter the size of the present the magnitude of the problems which have to be dealt with should be sufficiently clear. Unless something is planned—and planned on a sufficient scale—the situation will continue to deteriorate in proportion to the yearly increase in the size of the population.

Births and Birth Rate

——	1921		1931		1947	
	No.	Rate	No.	Rate	No.	Rate
Chinese	8,718	27.72	15,993	37.85	33,629	46.20
Malays	2,314	42.99	2,862	43.69	5,473	47.73
Indians	789	24.52	1,020	19.64	3,087	43.30
Europeans	187	31.00	169	20.55	312	35.79
Eurasians	209	38.99	199	28.53	359	39,84
Others	98	16.57	227	29,09	185	28.27
Total ..	12,315	29.47	20,470	36.37	43,045	45.89
Male	6,539		10,753		22,152	
Female	5,776		9,717		20,893	
Total ..	12,315		20,470		43,045	
Male births per 100 ..		53.00		52.04		51.23

Births by Sex and Race

Males	Urban Area	Rural Area	Total Singapore
Europeans	115	37	152
Eurasians	176	19	195
Chinese	12,574	4,812	17,386
Malays	1,650	1,132	2,782
Indians	1,152	403	1,555
Others	76	6	82
Total ..	15,743	6,409	22,152
Females			
Europeans	126	34	160
Eurasians	150	14	164
Chinese	11,701	4,542	16,243
Malays	1,694	997	2,691
Indians	1,173	359	1,532
Others	97	6	103
Total ..	14,941	5,952	20,893
GRAND TOTAL ..	30,684	12,361	43,045

The number of births in 1947 shows a very considerable increase over any previous census year and is more than double that for 1931. The present rate for the Colony is a high one. While the number of births fell to 24,441 in 1945, the yearly average for 1941 to 1944 was over 31,000. The number of Chinese births fell to 19,808 in 1945 with an increase to 31,209 in 1946 to 33,629 in 1947 as compared with 28,234 in the last pre-war year.

DEATHS AND DEATH RATE

	1921		1931		1947	
	No.	Rate	No.	Rate	No.	Rate
Chinese	10,533	33.32	10,599	25.09	9,368	12.87
Malays	2,199	37.39	1,905	29,08	2,029	17.70
Indians	1,064	32.95	820	15.81	878	12.32
Eurasians ..	132	24.56	103	14.76	84	9.32
Europeans ..	55	9.03	51	6.20	74	8.49
Others	128	21.47	145	18.58	78	11.92
Total ..	14,111	33.30	13,623	24.20	12,511	13.34

DEATHS BY SEX AND RACE

Males	Urban Area	Rural Area	Total Singapore
Europeans	42	19	61
Eurasians	33	1	34
Chinese	4,512	1,069	5,581
Malays	703	418	1,121
Indians	492	94	586
Others	31	3	34
Unknown	11	..	11
Total ..	5,824	1,604	7,428
Females			
Europeans	9	4	13
Eurasians	43	7	50
Chinese	3,058	729	3,787
Malays	515	393	908
Indians	238	53	291
Others	25	3	28
Unknown	4	..	4
Total ..	3,892	1,189	5,081
Unknown Sex	2	..	2
GRAND TOTAL ..	9,718	2,793	12,511

Deaths by Age Groups

Ages	Urban Area	Rural Area	Total Singapore
0 — 1 day	315	79	394
1 — 7 ,,	478	122	600
8 — 14 ,,	197	43	240
15 — 21 ,,	169	32	201
22 — 28 ,,	53	7	60
Neo—Natal Deaths	1,212	283	1,495
1 — 2 months	512	139	651
2 — 3 ,,	206	57	263
3 — 4 ,,	175	55	230
4 — 5 ,,	134	38	172
5 — 6 ,,	126	45	171
6 — 7 ,,	120	30	150
7 — 8 ,,	116	24	140
8 — 9 ,,	104	34	138
9 — 10 ,,	107	20	127
10 — 11 ,,	80	25	105
11 — 12 ,,	99	17	116
Infantile Mortality	2,991	767	3,758
1 — 5 years	1,001	362	1,363
5 — 10 ,,	232	103	335
10 — 15 ,,	148	51	199
15 — 20 ,,	239	64	303
20 — 25 ,,	316	992	408
25 — 30 ,,	436	114	550
30 — 35 ,,	463	114	577
35 — 40 ,,	590	144	734
40 — 45 ,,	590	160	750
45 — 50 ,,	594	149	743
50 — 55 ,,	549	116	665
55 years and over.	1,559	556	2,115
Age unknown	10	1	11
GRAND TOTAL	9,718	2,793	12,511

The death rate indicates a remarkable decline over the census periods and the present rate is a surprisingly low one when the living conditions of a large section of the community are taken into consideration. While the number of deaths recorded in 1946 (15,287), corresponded to the immediate pre-war year (15,705) and showed an astonishing drop from those recorded during the Japanese Occupation (42,751 in 1944 presumed to exclude executions), the 1947 total is a low record indeed. This can be taken as some indication of the work of the Government and Municipal Medical and Health organisations under very difficult conditions in spite of the criticism which can be, and has been, freely raised. Nevertheless the year under review has been abnormal in various directions. For instance the incidence of malaria has shewn a reduction throughout the country which cannot be accounted for by the measures undertaken to eradicate the disease alone. Certain immunities established during the careless and deficient Occupation period must play their parts as must the intensive health drive which has been established since that time. It is suggested, however, that premature congratulation and any relaxation in more intensive and extensive medical control will give the inevitable and disastrous result.

Turning to the details of deaths by causes (page 15) a really remarkable reduction is shown for all conditions over the pre-war average except in *malaria, violence* and *senility.* While these forms of deaths have decreased also over the last twelve months the following important diseases indicate a rise over the post war period: *influenza, bowel diseases and cancer.* Pulmonary tuberculosis has attracted a lot of attention over recent months. While it is impossible to say what the incidence is in the general population it is certain that the number of recorded deaths is now well below the pre-war figure and over 50% less than that recorded for 1944.

Certification of death is still open to serious inaccuracy in the rural districts where nearly one quarter of the number was recorded during the year. It is noteworthy that 770 rural deaths were placed in the category of unspecified fever (29%), 780 to infantile convulsions (29%) and 602 to senility (22%)—that is 80% of the total rural deaths.

Principal Causes of Deaths

Diseases	*Urban Area*	*Rural Area*	*Total Singapore*
Malaria	261	24	285
Enteric Fever	24	—	24
Diphtheria	25	—	25
Dysentery	84	15	99
Influenza	165	1	166
Tuberculosis of Respiratory System	1,419	49	1,468
Other forms of Tuberculosis	161	6	167
Leprosy	5	16	21
Syphilis	47	1	48
Tetanus	105	—	105
Ankylostomiasis	22	—	22
Fever Unspecified	152	770	922
Cancer	298	8	306
Acute Rheumatism	41	1	42
Beri-beri	340	58	398
Diseases of the Heart	381	22	403
Other Diseases of the Circulatory System	109	3	112
Bronchitis	305	1	306
Pneumonia (all forms)	1,196	43	1,239
Other Diseases of the Respiratory System	140	193	333
Diarrhœa and Enteritis	807	24	831
Other Diseases of the Digestive System	249	4	253
Convulsions	739	780	1,519
Diseases of the Nervous System and Organs of Sense	217	46	263
Smallpox	19	1	20
Non-venereal Diseases of the Genito-Urinary System	272	5	277
Diseases of Pregnancy, Childbirth and Puerperal State	90	35	125
Premature Births and Diseases of Early Infancy	820	33	853
Old Age or Senility	353	602	955
Violence (all forms)	556	17	573
Other Causes	282	34	316
Deaths pending inquest	34	1	35
TOTAL	9,718	2,793	12,511

INFANTILE MORTALITY

—	1921		1931		1947	
	No.	Rate	No.	Rate	No.	Rate
Chinese	2,264	206.23	3,041	183.83	2,671	79.43
Malays	680	263.61	772	261.36	784	143.25
Indians	474	192.65	171	163.73	236	76.45
Europeans ..	7	48.13	5	29.59	18	57.69
Eurasians	30	224.88	23	110.55	28	77.99
Others	18	61.22	34	149.78	21	113.51
Total ..	3,473	212.91	4,046	191.30	3,758	87.33

Of the 3,758 infantile deaths in 1947, 2,066 were males and 1,692 were females.

QUARTERLY RETURN OF INFANTILE MORTALITY 1947

Quarter	URBAN AREA		RURAL AREA		SINGAPORE		Rate per mille births
	Births	Deaths under 1 year	Births	Deaths under 1 year	Births	Deaths under 1 year	
First ..	7,528	807	3,032	227	10,560	1,034	98.01
Second ..	7,141	701	2,856	178	9,997	879	87.93
Third ..	7,659	795	3,084	165	10,743	960	89.36
Fourth ..	8,356	688	3,389	197	11,745	885	75.35
Total ..	30,684	2,991	12,361	767	43,045	3,758	87.33

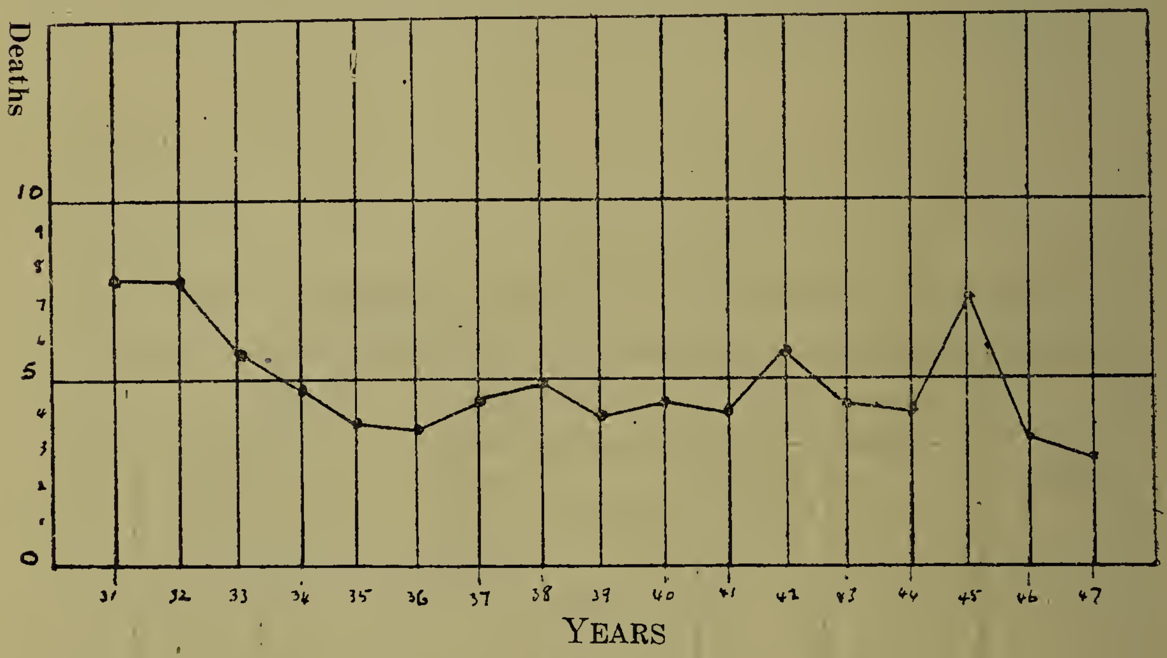
The infantile mortality rate is thus the lowest ever recorded. While the rate was 89.69 in 1946 and 130.47 in 1939, infantile deaths reached the shocking figure of 9,039 in 1944 (285 per 1000 births) and were very high throughout the entire enemy occupation period. The Chinese figure is of the most significance as it comes from the largest and one of the most prolific sections of the population. Although a large part of the reduction in the rate can be laid at the door of the Infant Welfare Services it is not the complete answer. Rice consumption, particularly the consumption of polished rice, has decreased over the post war period by force of circumstances. The lack of this and other unsuitable foods is thought by experienced observers to be an important factor in the reduced infant mortality figure.

During the year 671 *still births* were notified—563 in the urban area and 108 in the rural. The figure in this connection has remained fairly constant over the years, varying from 527 in 1933 to 816 in 1941, but the proportion to live births has shewn a strong decline from 27.7% in 1931 to 15.6% in 1947.

1947 returned a maternal mortality well below that of any previous year as a reference to the following chart clearly indicates:—

MATERNAL MORTALITY RATES 1931–1947

Deaths per 1,000 live births



TOTAL NUMBER OF DEATHS REPORTED IN SINGAPORE BY CAUSES—1939-1947

Causes	1939	1940	1941	Average 1939/41	1942	1943	1944	1945	1946	Index 1946	1947	Index 1947
Malaria and Unspecified Fever	1,045	1,248	1,155	1,159	3,018	2,402	5,555	6,055	1,929	168	1,207	104
Violence (all forms) ..	473	454	504	477	575	611	682	801	737	162	573	120
Beri-Beri	720	607	636	654	2,817	2,009	6,749	6,683	786	120	398	61
Senility	793	925	1,062	927	2,174	1,220	2,250	2,285	1,101	119	955	103
Bronchitis, Pneumonia and T.B. of Respiratory System	3,299	3,545	3,696	3,513	5,641	5,107	8,635	5,752	3,868	110	3,013	86
Heart Diseases	411	527	536	491	963	560	1,111	940	516	105	403	82
Diseases of Circulatory System	136	167	201	168	133	149	197	137	145	86	112	67
Diseases of Digestive System ..	417	425	385	409	447	404	727	539	370	90	253	62
Diseases of Pregnancy and early childhood	1,064	947	972	994	994	1,091	1,188	985	982	99	978	98
Infantile Convulsions ..	1,758	1,850	1,769	1,793	4,280	3,166	4,572	3,118	1,571	88	1,519	85
Diseases of Respiratory System	328	490	431	416	458	417	528	447	367	88	333	80
T.B. other than Respiratory System	146	220	193	186	81	88	109	72	163	88	167	90
Diseases of Genito-Urinary System	532	613	499	548	851	581	787	688	394	72	277	51
Diseases of Nervous System ..	358	492	464	438	511	380	425	498	310	71	263	60
Influenza-Acute Rheumatism	240	292	305	279	643	323	621	575	195	70	208	75
Typhoid, Dysentery, Diarrhoea and Enteritis ..	1,031	1,339	1,681	1,350	4,279	1,837	4,578	2,811	908	67	954	71
Cancer	330	367	362	353	232	258	225	176	217	61	306	87
Others	1,117	1,197	1,127	1,147	1,786	1,333	3,812	2,767	691	60	592	52
Total ..	14,198	15,705	15,978	15,302	29,883	21,936	42,751	35,329	15,280	100	12.511	82
Note:—Pulmonary Tuberculosis	1,643	1,708	1,791	1,714	2,172	2,282	3,324	2,764	1,976	115	1,468	86

(*a*) Indices are based on the 1939/41 average.

MIGRATION STATISTICS BY SEA AND AIR DURING 1947

IMMIGRANTS

Race	Men	Women	Children		Total
			Male	Female	
Europeans and Americans	10,611	6,308	1,306	1,208	19,433
Eurasians	83	64	14	11	172
Japanese	106	2	..	..	108
Chinese	64,761	22,967	8,204	4,886	100,818
Malays	6,477	1,220	383	314	8,394
Northern Indians ..	4,849	677	280	235	6,041
Southern Indians ..	15,447	1,844	779	729	18,799
Others	480	116	27	27	650
Total ..	102,814	33,198	10,993	7,410	154,415

EMIGRANTS

Race	Men	Women	Children		Total
			Male	Female	
European and Americans	11,222	4,748	738	653	17,361
Eurasians	65	32	6	10	113
Japanese	99	3	..	..	102
Chinese	66,298	22,484	7,933	5,546	102,258
Malays	6,932	1,157	397	271	8,757
Northern Indians ..	2,791	283	134	87	3,295
Southern Indians ..	18,686	2,462	1,846	1,628	24,622
Others	432	86	27	25	570
Total ..	106,525	31,255	11,081	8,217	157,078

PART IV

THE HEALTH DIVISION

1. General

Considerable progress towards getting back to pre-war standards of efficiency was made by the Government Health Department during 1947. Three additional temporary health officers helped the School Medical Service in particular to undertake a greatly increased programme of routine examinations and treatment. Credit may be taken for the absence of any outbreak of major infectious disease, apart from four cases of small pox—a residue of the small outbreak in the latter part of 1946. The malaria position was very satisfactory, reflecting the intensive efforts made to control dangerous mosquito breeding. During the year, in spite of some opposition, Port Health control was considerably tightened up, but experience has shewn that strict control under the quarantine and other existing regulations of all immigrants is absolutely essential.

2. Public Health Conference

Three conferences were held during the year, under the Chairmanship of the Director of Medical Services and attended by the principal Civil and Service officers engaged in public health work. The conferences continue to be a useful means of clarifying public health problems and standardising practice. The following important decisions in regard to quarantine procedure were formulated:—

(*a*) that internal air services be regarded as on the same parallel as the railways and other internal transport;

(*b*) that all deck passengers from infected ports be detained for a period of 48–72 hours;

(*c*) that before declaring a port free from plague no cases should have occurred for a period of 6 weeks beforehand;

(*d*) that in regard to the fumigation with hydrogen cyanide of ships alongside wharves the "risk area" should be 20 feet.

3. Rural Health

As over a quarter of a million of the Colony's population lives in the Rural Division of the Island, its health control is obviously of the greatest importance. In this connection co-operation between Village Committees and Authority is desirable and the setting up of this form of organisation during the year has helped towards this goal. Further action on these lines is to be welcomed in consequence.

(i) HYGIENE AND SANITATION

Malaria: Fifty-eight cases of malaria can be presumed to have been contracted in the rural districts.

Dangerous Infectious Diseases: There were 4 cases of smallpox in the early part of 1947, a residue of the small outbreak which commenced in August, 1946. The last of the four cases occurred on 13th March, 1947. From then Singapore regained its pre-war reputation as the most infection-free port in the Far East.

(*a*) *General Measures of Sanitation*

Mosquito Control: The fifty-eight cases of malaria reported as having contracted their infection in the rural areas can be considered a negligible number. Of these, seventeen were due to the appearance of A. sundaicus in disused gun emplacements along the sea coast and in a swamp. The swamp has been drained and the gun emplacements are now regularly oiled. In addition to the continuation of the rehabilitation programme, supplementary measures, such as oiling and drainage, were reorganised and stabilised, particularly in the vicinity of Service areas where this work is now carried out in co-operation with the Service Health Authorities. It should be pointed out, too, that anti-malarial work is constantly on the move as more areas are being opened up for housing. There is a very much larger population to protect than pre-war and rural villages are constantly extending. This will necessitate an expansion of permanent anti-malarial work in future years, quite apart from rehabilitation and routine measures.

A constant supply of anti-malarial mixture is now available so a seven day oiling programme is being maintained in all districts. New permanent drains were constructed, totalling 1,130 yards in length, while permanent drains repaired were 4,194 yards in extent. Five thousand, two hundred and seventy-five yards of sub-soil drains were repaired. A total length of 54,520 yards of drains, permanent and earth, are maintained today. Anti-malarial mixture used totalled 35,291 gallons and D.D.T. mixture used totalled 520 gallons.

It is expected that revenue amounting to about $15,000 per annum will be collected during 1948 for cost of oil on private properties. A "return" scheme which before last October because of the poor quality of the oil and irregular supply has not been possible will be instituted. A schedule of anti-malarial work carried out and materials used will be found in Appendix *III*.

(*b*) *Sewage and Refuse Disposal*

The re-establishment of satisfactory and approved methods of refuse disposal and nightsoil collection was faced with various difficulties. Pre-war composting on a large scale has now been re-instituted. At the liberation all composting beds had been found to be destroyed. There were no public refuse bins on our return and the days when each householder had an approved type of refuse bin appeared to have gone forever. To meet the situation the Health Department distributed 100 large dustbins at strategic points in the villages, put 80 collection carts on the road and served every householder with notice to provide an approved type of household bin. The response has been good and at the close of the year daily collections of refuse averaged 15 tons. Refuse is either composted or dealt with by controlled tipping to cover up low-lying areas.

Of 13,554 latrines inspected, 2,079 were found to be insanitary. Action is proceeding on them.

(c) *Offensive Trades*

The inspection of premises licensed under Section 211 of Chapter 133 (Municipal) was carried out by District Sanitary Inspectors and 22,985 inspections were carried out in relation to the preparation and sale of food. The number of piggeries licensed was 1,516.

(d) *House Inspection*

Unauthorised building continues to constitute a serious problem. It is estimated that there are about 12,000 unauthorised houses in the rural area. This department has drawn the attention of the Rural Board to the seriousness of the situation and to the necessity of special staff (at least temporarily) to deal with it. Routine house inspections by Sanitary Inspectors totalled 14,304 and any defects found were dealt with. A further 2,283 inspections of Government buildings were made.

Other inspections were 6,908 of factories and workshops; 20,445 of premises selling or dealing with food for human consumption; 2,540 of itinerant hawkers; 2,158 of premises carrying on offensive trades. These are summarised in Appendix *IV*.

(ii) MATERNITY AND CHILD WELFARE

That this is one of the most important aspects of the public health campaign in Rural Singapore was fully stressed by the late Dr. Kauntze (late Chief Medical Adviser to the Secretary of State) on his visit to this Colony in January. It is certainly one which continues to receive enthusiastic support from the public. As clinics are still operated in very unsatisfactory and primitive conditions after twenty years of endeavour, up-to-date buildings for this purpose receive an important place in the Medical Plan. Of the 22 places at which clinics are held, only 5 buildings are the property of Government and only 2 of these were constructed for the purpose. The remainder are held in dilapidated shophouses, coolie lines, a police pound and an old chandu shop—definitely unsuitable premises either for staff quarters or for medical activity. In spite of these unfortunate drawbacks, the staff of nurses and midwives carried out a most valuable programme of work during the year. Home visits made by nurses alone amounted to 50,732 and the midwives attended 5,215 confinements.

Attendances at the clinics of mothers and children, including revisits, totalled 91,015. A total of 633,146 milk feeds were issued to expectant mothers, nursing mothers, infants and children up to 4 years of age. Figures relating to these will be found in Appendices *V* and *VI*.

At the close of the year the staff consisted of one Public Health Matron, one sister (a local promotion), 17 nurses, 17 midwives and 13 attendants.

The infant mortality rate for the rural area in 1947 was 62.05 per mille, the lowest figure on record. As this rate is taken as an index of the health of the general population, this very low figure in a tropical country is a remarkable tribute to the value of the work of the Maternity and Child Welfare staff under the conditions prevailing.

There are nine centres with a resident nurse, midwife and attendant, and six sub-centres with a resident midwife and attendant only. Weekly clinics are held in two other districts, and bi-monthly clinics in five of the neighbouring islands. During the year only one centre was rehabilitated: the local population presented this department with a building for use as a centre in one area and is building its principal clinic in another. Recommendations for new buildings have been submitted but have not yet received approval.

During the course of training in the wards of the Maternity Hospital Pupil Midwives are received at the Centres for training in domiciliary district midwifery, under the supervision of a senior midwife. During this period of six weeks they also attend two infant and one pre-natal clinic each week.

(iii) Travelling Dispensaries

The Singapore Rotary Club presented the department with a Mobile Dispensary in May, and in July the department purchased a new Austin Mobile Dispensary. There are thus three dispensaries covering the rural areas. Their itinerary has been so planned that each particular area receives at least two visits per week. This in contrast to the fortnightly visit on a much more restricted schedule of the year before is a tremendous improvement. The work covered by these mobile dispensaries is given in Appendix *VII.*

While two static dispensaries operate in the non-municipal area, outpatient departments deal with an ever expanding service in the three main hospitals of the city. This will be the most that is possible under existing conditions in view of the fact that no Outpatient Departments exist in the meaning of the term in the United Kingdom. That this demand is there and that this service on a proper basis is an urgent necessity is evidenced by the following figures:—

	Outpatients	
	New Cases	*Total Attendances*
1938	37,969	87,447
1946 (June/December) ..	71,230	164,688
1947	188,002	530,116

The Medical Plan referred to in Part IX indicates what is required in these respects.

4. **Port Health**

With the return of shipping activity approaching almost pre-war level, the work of this section has increased considerably during the year under review. Whereas in 1946 a total of 732 ships of 2,541,647 nett tons were dealt with, in 1947, 1,547 ships from infected ports, totalling 4,452,350 nett tons were inspected and cleared and 56,032 deck passengers were sent to the Quarantine Station at St. John's Island. The value of this procedure was amply demonstrated on two occasions when cases of smallpox which had been concealed on board ships were discovered at the check-up on St. John's Island. Furthermore, it should be recorded that these cases and many other passengers, although in possession of vaccination certificates on valid forms, admitted they had not been vaccinated. The 48–72 hour period of detention is also of value for "screening" passengers for leprosy, tuberculosis, syphilis, trachoma, etc. Port Health and Quarantine work is therefore being speeded up and to this end provision has been made in the 1948 Estimates for new and fast launches for ship inspection and for passenger barges for transporting passengers from the quarantine anchorage to St. John's Island. At the moment, the Health Department has no launches or barges as was the case pre-war, and this is causing considerable inconvenience and delay to all concerned. Funds are also being sought for providing a proper water supply for the Island and for rehabilitation and reconstruction of many of the camps which have suffered many years of neglect.

The Quarantine Station is deficient in accommodation. As it was designed very many years ago it does not comply with present day standards. Essential requirements which will take both heavy capital expenditure and time to meet have been included in the Medical Plan. Until the money has been approved for this purpose very little can be done to meet the legitimate public criticism in this respect.

The greatest number admitted to the Quarantine Station on one day was 2,103 contacts. The average stay of contacts on the island was 7 days.

Fifty-one thousand seven hundred and seventy-seven vaccinations and inoculations were performed; 129 patients were treated in hospital. Communicable diseases dealt with on the island were smallpox 8; chickenpox 20; cerebro-spinal meningitis 2; other minor infectious diseases 33. *Vide* Appendix *VIII*.

Plague Prevention: During the year a most important preventive measure was introduced for the first time—namely the fumigation of ships with hydrogen cyanide. Altogether 54 ships had been fumigated by the end of the year and many rats destroyed. Deratisation exemption certificates were issued to 189 ships. The method employed is by the use of H. C. N. discoids and the work is carried out by a firm dealing in such measures, under the direction of this department.

In March, 1947, the use of International Vaccination Certificates in the form of approved booklets was introduced and at the end of the year 7,716 of these had been issued.

The following immunisation work was carried out:—

Smallpox vaccination	30,989
Cholera	28,246
T.A.B.	398

Major Infectious Disease: There were four cases of smallpox in the early part of 1947—a residue of the small outbreak which commenced in August, 1946. The last case occurred in March.

5. Air Health

The arrangement whereby civilian arrivals by air at Changi or Tengah Airports were dealt with by the R.A.F. Medical Authority continued until towards the end of the year, the civil authority confining its activities to Kallang, as only one Health Officer could be spared for this work. With the increases in air traffic however the civil authority had to assume responsibility for Tengah as well and a local hospital assistant had to be detailed to assist, as these two posts are a considerable distance apart. Tengah deals with the larger aircraft now that Changi is under reorganisation. There is no question that Air Health is, and will continue to be, an increasingly important and onerous duty if Singapore is to retain its position as one of the world's airports: an increased health control organisation cannot be avoided in consequence.

All aircraft from infected ports were examined—640, carrying in all 13,245 passengers, being dealt with.

6. School Health

School Medical Services: Considerable progress in school hygiene was made during the year, as evidenced by the number of examinations and re-examinations carried out. There were 20,852 of these as compared with 7,422 in 1946 and of this number 15,416 were re-examined as a check up on improvement and treatment received. The most important feature during the year was the institution of regular home visits by a school nurse to tubercular and "probably" tubercular children who had been excluded from school. School nurses worked independently of doctors for the first time in 1947 and in addition to carrying out mass worm treatment in the schools they also examined children for dental caries and defective vision. As there are, however, 61,601 boys and 29,704 girls in 276 schools, it is obvious that this work must be considerably extended.

Judging by the examinations carried out, the very unsatisfactory position with regard to dental defects in school children is getting worse, and the sooner a School Dental Service is started the better. Thus that this matter will receive attention for the first time in 1948 is a matter for congratulation. At the same time a new and combined up-to-date School Medical and Dental Clinic, with a sufficient transport system, is badly needed for carrying out this important work. While two small clinics and a school bus were in operation, this can only be looked on as a start in the right direction.

A Cardiac Clinic with the necessary electro-cardio-graphic equipment has now been established at the General Hospital.

Undernourishment and tuberculosis: While the general standard of school health improved during the year *pari passu* with the improvement in social conditions in Singapore there still remained 6,581, or 31.5% of those examined, who appeared to be undernourished and so in poor health. Compare this with 49.4% in 1946 and 5% before the war. Only in one boys' school did the figure reach 6%.

It is not surprising, therefore, that tuberculosis seems to be more prevalent amongst Singapore's children than in any pre-war period. Nearly 2% of those examined were diagnosed on clinical grounds and girls seemed to be infected in excess of boys. Out of 8,627 girls examined 323 (3.7%) appeared to be infected, compared with 43 boys out of 12,225 (0.35%), The majority of these were Chinese and the proportion is without doubt due to the greater attention the male sex receives in the poorer section of this community. All the children were referred for x-ray examination, some 35% proving to be definitely positive. It is interesting to note that eight cases turned out to be eosinophilia of the lung. Home visiting and medicinal treatment has to suffice for the majority of these young patients but this course will be augmented during the coming year by a greater hospitalisation programme at Tan Tock Seng Hospital and an increased outpatient attention at the new clinic to be opened up there.

Medical examinations carried out by the same observers indicate that pre-war the age group most concerned was that of puberty and upwards: post war it seems to be from 6–14 years. Pre-war this group returned the figure of 0.1% infected and this is the disturbing factor in Singapore's post war tuberculosis victim. There is no question that the disease has increased in the child population and this is the section we must concentrate on in consequence. This means a very increased attention to the School Medical Service and to the pre-school child. Unfortunately, the 1946 school feeding scheme was not continued in 1947: fortunately money was forthcoming for the purpose to a limited extent for the pre-school child through feeding centres run by the Social Welfare Department.

It is clear that a child feeding campaign must be prosecuted with vigour in Singapore as one of the main items in the anti-tuberculosis campaign. Additional money is being sought for a home visiting and relief scheme in addition. Some such procedure is considered to be an essential and a vital link in what must be done. It is clear that a good deal more money must be spent on our children: many cases are in the early stage of the disease when it is most amenable to treatment.

Leprosy: Forty-five cases of leprosy were seen during the year—35 boys and 10 girls (36 Chinese, 5 Indians, 3 Malays, 1 Filipino). All except three were of the early type and responded well to treatment.

Dental Caries: The Professor of Dental Surgery states that some 90% of our children need dental treatment and it is certain from the school examinations carried out that over 70% of the girls and over 40% of the boys had really bad teeth easily observable. The need for an island dental scheme cannot be over emphasised.

Vaccination: A majority of the children had been vaccinated by the end of the year, nearly 60,000 being done in 1947 alone.

Other Conditions: Other conditions were classed as follows:—

	%
Tonsils and adenoids	29.90
Skin conditions	30.00
Anæmia (mostly due to intestinal parasites)	21.20
Enlarged spleen	1.10
Defective vision	2.70
Mumps	2.90
Chickenpox	1.37
Malaria	1.05
Measles	0.30
Whooping Cough	0.23
Diphtheria	0.18
Typhoid	0.13
Syphilis	0.14

Special Treatment: The following special treatment was carried out:—

Diphtheria immunisation	1,490
Remedial exercises	197

Note on School Teachers: Five hundred examinations (264 men and 236 women) showed an improved health picture over 1946, particularly in men, although still below the pre-war level. 26.3% continued to show signs of undernourishment and poor health. Malay women teachers returned the lowest level of health.

7. The Nutritional State

The nutritional state in Singapore has been deduced from the following observations of Dr. C. J. Oliveiro:—

1. *Family Dietary Investigations:* This work, which was commenced in 1946, has been continued throughout the period under review. Two hundred and forty-four families including 157 Chinese, 39 Malay and 48 Indian respectively were investigated in regard to their food consumption and food habits.

At the end of the dietary survey, wherever possible, the various members of the family were submitted to a clinical assessment of the state of nutrition, paying particular attention to the signs that are thought to be due to dietary deficiency. The families were of the same occupation as last year and most of them on a low income level. The main object of the investigations was to determine among other things the nutritional status of families earning low incomes so that any deterioration in the state of health of the working classes might be observed. The results of the dietary surveys shewed that a large proportion of the families were subsisting on unsatisfactory diets and that the predominant deficiencies were in calcium and riboflavin. The diets appear to be more unbalanced than those consumed last year in regard to Vitamin *B* deficiency. This imbalance is related to the fact that more rice is being consumed by the public this year than in 1946. Owing to the increase in wages in the lower earner groups and also to the large amount of rice procurable from the black market, more money is being spent on purchasing rice to supplement what the local population considers to be a totally inadequate official ration of about 5 oz. per head per day. In 1946 wheat flour and products such as bread and noodles were mainly used to supplement the rice ration. It has been found that the average working class family is purchasing from 20 to 25 katties (29 to 33 pounds) of black market rice per month. The quality of this has on the whole been poor: it was largely in the form of either broken grains or highly milled grains. One of the bad local habits is the excessive washing of rice prior to cooking, with the result that most of the members of the vitamin *B* group get leached out. Although more rice is being purchased the amount consumed still falls far short of the quantities eaten in pre-war years, largely due to the high cost of this commodity on the black market. Although prices of the various comestibles have shewn a welcome tendency to fall during the year they are still about three to five times the pre-war cost. The liberal consumption of large quantities of poor quality rice would certainly result in the rise in the incidence of beri-beri.

Lack of suitable protein during the period of growth may account for the poor muscle that one sees in a large proportion of the local children.

The diets are markedly low in calcium and riboflavin. While signs of the former are seldom seen, the latter manifests itself in the tongue lesions which are frequently seen in children.

Vitamin *C* seems to be in adequate supply. In spite of the losses incurred during the cooking of vegetables there still seems to be sufficient to supply the daily requirement. The absence of signs of scurvy in Singapore tends to confirm the view that a deficiency of Vitamin *C* is not a health hazard. Although simple gingivitis occurs in about 10–20% of the children it remains to be established whether this condition is due to a deficiency of Vitamin *C* or to one or more members of the Vitamin *B* group.

In the diets of the families surveyed the Vitamin *A* is derived mainly from the Carotene of green Vegetables. An insufficient intake of this nutrient by the Malay families may explain the presence of the cases of keratomalacia and Bitot's spots which are ascribable to a deficiency of Vitamin *A*.

Food Habits: During the dietary investigations the methods employed by the families in the preparation and cooking of the various foodstuffs were recorded.

(*a*) *Washing and cooking of rice:* Depending on the quality of the grain supplied, the rice is washed in at least three changes of water, the fingers being used to facilitate this. In general, washings are made until a fresh portion of the water when added and the contents lightly stirred leave a clear supernatant liquid. With the Chinese and Malay families no liquid is thrown away during the cooking process but all the Indian families investigated add excess water and drain away the liquid when the rice is almost cooked.

(*b*) *Preparation and cooking of green vegetables:* The methods used by all the families for the cooking of green vegetables appear to secure the maximum nutritive value. The losses of the nutrients, especially Vitamin *C*, takes place during the interval that elapses between the cutting of the green vegetables and the moment the vegetables are cooked, and in the reheating of the foods prior to consumption. The method commonly adopted is as follows:—

In the cooking vessel (metal pan or earthenware pot) some oil is poured and heated. Salt, spices and condiments are added and fried for a few minutes. Then a cupful of water is added and the contents are brought to the boil. The cut up green vegetables in bulk are then put in and allowed to cook until tender, the process taking from 10–15 minutes.

The Malay and Indian families cook the day's vegetables in the morning and reserve a portion of the cooked meals for the evening. Prior to consumption the cooked vegetable is warmed before serving. In the case of the Chinese the vegetables are usually cooked before each meal.

Results of the clinical examination of the families: At the end of the dietary survey the members of the family were examined clinically, paying particular attention to the presence of objective signs referable to nutritional deficiency. No cases of beri-beri were encountered. Results of the clinical examination of 244 children were as follows:—

Bitot's spots	2 (0.8%)
Keratomalacia	1 (0.4%)
Folliculosis (face)	1 (0.4%)
Gross dental caries	67 (27.0%)
Swollen gums	30 (12.0%)
Magenta tongue	52 (21.0%)
Erosion tongue	6 (2.0%)
Angular stomatitis	7 (3.0%)
Xerosis, skin	48 (20.0%)
Crackled skin	1 (0.4%)
Phrynoderma	3 (1.0%)
Stigmata of rickets	2 (0.8%)
Musculature poor	63 (25.0%)
Poor physical condition	108 (44.0%)

From the above it can be seen that about 45% of the children examined were in a poor state of nutrition. The cases of Bitot's spots and keratomalacia were observed in Malay children.

Survey of food consumption of medical students: A survey of the food consumed by medical students residing in one of the students' hostels was made during January. The investigation lasted for seven days and the results showed that the food as supplied to students was fairly satisfactory in regard to the essential nutrients. The average age of the students was about 26 years and the average height and weight were 5′ 6″ and 126 lbs. respectively. No significant gain or loss in weight was recorded at the end of three months. The calculated potential nutrient values from the edible portion of the foods for the survey period was as follows:—

Calories	2,820	
Protein	95	grams
Calcium	650	milligrammes
Iron	23	milligrammes
Vitamin *A* (I.U.)	15,000	
Thiamine	1.5	milligrammes
Riboflavin	1.7	milligrammes
Niacin	20.3	milligrammes
Vitamin *C*	166	milligrammes (30 mg. from fruits)

The results did not include snacks, sweets, chocolates, etc., which are indulged in by the students and it is probable that the calorie requirement of the average student would be 3,000 calories.

Health of School Children: Information obtained from the Medical Officer in charge of schools revealed the fact that the health of the school children had shewn an improvement over that of last year. Out of a total of 21,600 children an absenteeism of about 3%

was reported and this was due to causes other than malnutrition. According to the clinical examination the percentage number of children who were in a poor state of nutrition was 31.6% as compared with 49.4% in 1946. Skin lesions due to deficiency disease such as phrynoderma and dry crackled skin dropped from 37% in 1946 to 24% this year.

In the Annual Medical Report for 1946 it was noted that the difficult food conditions prevailing during that year had a retarding influence on the rate of growth of school children although no further breakdown in their health occurred. It is to be noted that on the whole there has been satisfactory improvement in the growth rates in all the age groups concerned.

AVERAGE HEIGHTS AND WEIGHTS OF SCHOOL BOYS

Age in years Feb. 1946	October, 1946		February, 1947		May, 1947		November, 1947		Gain	
	Height inches	Weight lbs.	Height inches	Weight lbs.	Height inches	Weight lbs.	Height inches	Weight lbs.	Height inches	Weight lbs.
8	46.6	45.9	48.2	48.4	49.3	50.7	50.4	52.3	3.8	6.4
9	48.2	48.8	49.9	53.5	50.0	53.7	51.4	54.2	3.2	5.4
10	50.5	52.6	51.5	56.1	52.0	56.6	53.4	59.6	2.9	7.0
11	52.4	60.0	52.9	60.1	53.4	60.7	54.8	64.8	2.4	4.8
12	54.6	67.0	55.0	67.7	56.2	70.9	57.0	74.9	2.4	7.9
13	56.1	71.3	57.3	73.7	58.0	77.5	59.2	81.5	3.1	10.2
14	58.8	82.2	59.9	86.2	60.2	89.3	62.1	94.8	3.3	12.6
15	60.9	88.6	61.0	88.7	61.6	94.1	62.9	99.2	2.0	10.6

A reference to the School Medical Report clearly indicates the increase in incidence of tuberculosis in school children. That this is intimately bound up with the Japanese Occupation period cannot be doubted. The presumption is that poor nutrition during that period has resulted in a poorly developed child population with an increased lack of resistance. Only an increased attention to health and child feeding can eradicate this tendency.

Feeding of children of pre-school age: Towards the end of 1946 the Singapore Government approved a scheme for the supply of a free, nutritious meal to any undernourished child, irrespective of race, between 2 and 6 years of age. Measures to implement this feeding scheme were undertaken by the Department of Social Welfare and in January the first feeding centre for this vulnerable age group materialised. Up to the end of 22nd December feeding centres for children of pre-school age with a total attendance of about 4,500 were in operation. Of this total, 56% were Chinese, 40% were Malay and the remainder were Indian. The children were mostly from indigent families. The meal provided to the children was prepared from a mixture of lightly milled rice, meat or fish—preferably of the small variety in which the bones were eaten, a green leafy vegetable and a legume. In addition a piece of fresh fruit and from 3–5 oz. milk were given. The intention of the meal was to rectify deficiencies in the essential food factors so obvious in the home diets of the children of the poorer class. That their diets are entirely unsatisfactory can be judged from an example of the daily fare received by the child in the home. Breakfast consists of sweetened black coffee without milk with a slice of white bread or piece of cake prepared from rice or wheat flour. Occasionally a teaspoon of sweetened condensed milk is added to the coffee and, in families who can afford the expense, jam is smeared on the bread. The mid-day meal is usually made up of highly milled rice with a small piece of fish or meat. Green leafy vegetables are rarely taken. In the evening the food eaten is a repetition of the midday meal.

Very close liaison is maintained between the Department of Biochemistry and the Department of Social Welfare in the child feeding scheme and suggestions as to substitutes and alterations to the daily menus are constantly being made. When the children first received the meals it was noticed that most of them just ate the rice and discarded such items as meat or vegetables or beans for the simple reason that they had all along been accustomed to a home meal in which rice figures predominantly. With persuasion and adequate supervision the children improved in their food consumption habits and it is gratifying to note that very little wastage occurs now. Simple talks on the nutritive value of the meals have been delivered to children and guardians attending the child feeding centres. The gravies given to the children were enriched towards the latter half of the year by the addition of either a small amount (1/6–1/8 oz.) of dried food yeast or meat extracts. The record cards of 4,050 children were analysed with the following results:—

Folliculosis (face)	5	
Decayed deciduous teeth	3,721	(92%)
Swollen gums	654	(16%)
Magenta tongue	419	(10%)
Erosion tongue	250	(6%)
Angular stomatitis	287	(7%)
Dry skin	811	(20%)
Phrynoderma	3	
Sores (generalised)	174	(4%)
Stigmata of rickets	76	(2%)
Anæmia	1,225	(30%)
Poor physical condition	1,822	(45%)

It can be seen from the table that no cases of beri-beri were recorded. Most of the children were underweight in relation to their height and age. The high incidence of anæmia which was determined subjectively may be due to a combination of causes such as inadequate iron intake in the diet, helminthiasis, etc. One interesting feature of the clinical findings is that most of the cases showing erosion of the tongue and angular stomatitis occurred in apparently well nourished children. It is probable that these particular oral manifestations of riboflavin deficiency are precipitated by a greater ingestion of carbohydrate foods in an unbalanced diet, thus upsetting the relationship of the riboflavin required by the body tissues and the energy intake.

The results of the child feeding scheme have been very encouraging. Of the total number attending the centres it was found possible to carry out regular periodical examinations in about 1,700 children. Approximately 60% of the children gained in weight; in 29% there was no improvement and 12% lost weight. Irregular attendances and illness are the factors that are probably responsible for those children who showed no improvement. About 55% showed a clearing up of the minor manifestations of the various states of nutritional deficiency. The general impression gained from the data is that, given proper supervision and regular attendance at the clinic, the giving of a free nutritious meal is remarkably beneficial to the health of the young growing child. In view of the high incidence of malnutrition existing among the children of the indigent class in Singapore, this free feeding scheme is necessary, is justifiable and is essential.

Miscellaneous Reports: Enquiries from various medical officers in hospitals, infant welfare centres and from private practitioners elicited the information that beri-beri was rarely observed. A partial explanation for this low incidence was offered in last year's report in that the amount of rice eaten by the public still falls far short of the quantity consumed by the hard working labourer during the pre-war period, with the result that the thiamine/caloric ratio is more favourable to its prevention.

Summation of the Nutritional Status in Singapore: The general impression is that although a large section of the population is receiving an unsatisfactory diet gross signs of deficiency disease such as beri-beri are conspicuous by their low incidence. The nutritional status can be said to have improved in general during the year. Nevertheless, there still exists a 30–40% proportion of the child population of the poorer and middle class which suffers from lack of a satisfactory diet. The most important nutritional measure ever undertaken here to combat malnutrition in children has been the institution of the child feeding centres where a free nutritious meal is supplied to children of pre-school age. This scheme should be continued and steadily extended and should include children of school age. It must be looked on as one of our principal anti-tuberculosis measures. The revelations of the school medical section are a sufficient indication of this.

PART V

HOSPITALS DIVISION

1. General

Singapore completed its first full working year since the inception of Civil Government in occupation of all its pre-war hospital buildings. Rehabilitation of hospitals and quarters has made and is continuing to make steady progress. The work at the Mental Hospital had been largely completed and accommodation for 900 patients is now available. Kandang Kerbau Maternity Hospital has had its bed strength increased by 30 beds to the recent figure of 220 beds. In the General Hospital the existing Sisters' and Nurses' Home has been completely overhauled and essential alterations made to improve living conditions. This building was ready for occupation at the end of the year and sufficient new furniture has been acquired to furnish it completely. The nursing staff had been housed in wards and dilapidated and overcrowded quarters widely scattered over the hospital compound, and the completion of the Home is a big step forward. Lack of this accommodation has been a serious handicap to the satisfactory housing of the nursing staff. The re-occupation of the Sisters' and Nurses' Home has made available quarters which were badly required for the housing of medical officers—another serious difficulty.

The General Hospital has been expanded to the limit of the present available staff by the opening up of an additional hundred beds, giving a working total of some 600 beds with an emergency capacity up to 700.

Good progress has been made at the Tan Tock Seng Hospital also, with an increase up to 326 beds as compared with a pre-war figure of 72 beds for tuberculosis out of a total of 550.

While the bed *potential* in Government controlled hospitals, excluding the Mental Hospital, Leper Settlement and Venereal Disease Hospital, amounted to some 1800 only 1,200 of these were available for acute illness.

The most serious difficulty at present is the shortage of trained local nurses. Every effort will be made to overcome this but the salary scales have not been implemented to date and until this is done propaganda, even coupled with better housing and living conditions, will not help to increase the recruitment of suitable candidates. The scheme of training of nurses is being revised and teaching in the Preliminary Training School is being brought up to date under the supervision of a newly appointed, fully qualified, Tutor Sister. It is hoped to bring in legislation in 1948 to get the local S.R.N. certificate recognised by the Nursing Council of England and Wales.

The limited number of beds for acutely ill patients has thrown a very heavy strain on the various outpatient departments. The following table makes this position abundantly clear:—

	Outpatients	
All Hospitals	*New Cases*	*Total Attendances*
1938	37,989	87,447
1946 (April/December)	71,230	164,688
1947	188,002	530,116

In keeping with the general increase in work, the figures from the Blood Transfusion Unit are also of interest. Nine hundred and ninety-six cases received blood transfusions during the year—a figure almost treble that of 1946. One result of this increase, unfortunately, has been that the Blood Bank has been extremely difficult to maintain with an adequate reserve for a million people in view of the poor response to all our propaganda efforts so far.

The work done by the Radiological Department during the year under review was enormous, considering the smallness of the staff involved. A total of 17,537 x-ray examinations were carried out compared with 6,000 in 1938. The present technical staff consists of one radiologist, one radiographer and one part-time radiographer. By modern standards any X-Ray Department undertaking this yearly number of examinations would have eight full-time radiographers available.

The departments of Medical and Surgical Physiotherapy made progress during the year, the Surgical Unit treating 20,206 patients. The Medical Unit, which has only been functioning since August, has carried out a total of 3,083 treatments.

The high incidence of tuberculosis has received particular attention during the year, and every effort has been made to improve the facilities for treatment and to increase hospital accommodation. Tan Tock Seng Hospital was finally selected as the proper institution for the treatment of this condition and the available beds have been increased steadily as wards have been reconditioned and trained staff has become available. In this hospital, in 1939, 72 beds were allocated for this purpose as compared with 216 in 1946 and 326 in 1947. Hospitalisation is also available for a limited number in the General Hospital. Total admissions to the General Hospital, of all types, were 589; Tan Tock Seng Hospital, 1,048. The number of deaths were 202 and 386 respectively, this high death rate being due to the fact that many cases are not seem until a late stage in the disease. Although pulmonary tuberculosis has the greatest incidence the number of cases of tubercular meningitis admitted to the Children's ward is in excess of pre-war and amounts to almost double the number then admitted, another pointer to the conclusion that it is the children to whom we must devote our main attention in this disease.

That the facilities for the treatment of venereal disease have been improved during the year is evidenced by the following comparative figures for new cases:—

	Females	*Males*	*Total*
1946	1,267	4,984	6,251
1947	2,540	8,065	10,605

Treatment is undertaken at a clinic in the dock area and at a special clinic-hospital which has admitted over 80 patients at one time and is situated in the centre of the town. A follow-up scheme has been instituted and is undertaken by local women supervisors. This is having a satisfactory effect in bringing contacts and relatives under the observation of the medical staff. The above figures have no particular reference to increases in the incidence of the disease in the population but to an advance in treatment.

It is interesting to note that the General (including cases of venereal disease) and Kandang Kerbau Hospitals inpatients were less in 1938, when more beds were available, than in 1947:—

1938 ..	.. 25,913 inpatients	892	average occupied beds
1947 ..	.. 27,514 ,,	770	,, ,, ,,

A classification of inpatient admissions to the various hospitals during 1947 will be seen in Appendix *IX* and a classification of diseases treated in Appendix *X*.

The Medical Unit, despite the fact that it admitted only acute and seriously ill cases and those requiring special investigation, averaged 65 patients per ward of 44 beds. In addition to the care of these patients, teaching was carried out and weekly clinical meetings arranged.

Research work undertaken was of a minimal nature in view of the heavy routine. Investigations are being carried out on eosinophilic lung and a preliminary report has been published. Special histological studies are being made of deposits of pleural effusions and of material from liver punctures. Certain cases of anæmia are being treated with Folic Acid. As only small quantities of streptomycin were available during this year's investigations, work in this connection was limited to three cases of tuberculous meningitis; two of these have since died.

While malaria still figures prominently in hospital admissions better results have been obtained in the treatment of cerebral cases. Tables showing types and the terminal causes of deaths will be found in Appendix *XI*.

Pneumonia is still very common and although the mortality rate has been lowered considerably by the use of sulpha drugs and penicillin, the percentage of death in broncho-pneumonia in children is still in the region of 74%.

The quick response of many cases of bacillary dysentery to sulphaguanidine therapy shortened hospitalisation considerably.

The adoption of the Army laboratory routine for diagnosis of fevers has led to increased accuracy of diagnosis in the recognition of minor cases of Leptospirosis without jaundice as a cause of short fevers.

Over 90 cases of eosinophilic lung have been recognised.

In the Children's ward admissions numbered 1,600 with a mortality of 45%. This seemingly high mortality figure is accounted for by the fact that (*a*) most of the diseases dealt with here are serious ones particularly liable to a fatal termination, and (*b*) parents still tend to delay admission of young children until it is too late. The present figure approximates to the pre-war mortality rate.

Some success was achieved in the treatment of cases of tetanus neonatorum. This may be due to the use of penicillin and sulphathiazole in the treatment of the secondary infection and to the administration of haustus paraldehyde for control of spasm. Paraldehyde is less toxic to the myocardium than chloral hydrate.

In approximately 90% of all admissions to the Children's ward symptoms of malnutrition were present. These varied in degree from marked to mild and the bulk were drawn from the poorer classes.

Tuberculosis among children admitted showed a post-war increase as evidenced by the following figures:—

	Admissions	*Tuberculosis*	*%*
1937	2,900	100	3.40
1947	1,600	203	12.68

A table showing the causes of death in inpatients in the General Hospital will be found in Appendix *XIII.*

In the Surgical units, in spite of a considerable demand for beds, no patient considered curable was refused admission. Long term cases were eventually transferred to Tan Tock Seng Hospital or, in the case of tuberculosis of joints in children, to St. Andrew's Orthopædic Hospital, Siglap. Ambulant fracture cases were sent to the Department of Physiotherapy. Physiotherapists also gave invaluable assistance in the after-treatment of injuries and the exercise of operation cases, thus reducing the previous hospitalisation period considerably.

The number of operations performed at the General Hospital during the year was as follows:—

Unit	*Major*	*Minor*	*Total*
A	225	885	1,110
B	780	1,055	1,835
D	530	1,067	1,597
O.P.D.	—	250	250
Eye Dept.	—	—	1,549
	1,535	3,257	6,341

Reference should be made to the help given by the Department of Social Welfare in referring cases for operation, providing apparatus for patients' use in their homes and in arranging for their convalescence, but a service of this nature within the hospital would be of more practical benefit. An Almoner's Department is now within sight. The need for social work within the hospital has been increasingly felt for some time, but there have been certain difficulties about starting it under trained personnel. A survey is being carried out by an almoner from St. Thomas's Hospital and it is hoped that the main difficulties will be overcome and a department establishment in the very near future. Her report will set out the functions of an almoner's department, allude to conditions found in relation to principles of relief, and make recommendations for the setting up of a department, its staffing and the training of future staff.

The amount of work undertaken by the hospital clinical laboratories is seen in Appendix *XIV,* and is considerable in view of the shortage of trained laboratory assistants and laboratory space. Plans and equipment are available for extension.

A comparison of approximate diet costs is seen below. The Lucius Nicholls standard basic diet has been fully implemented in all hospitals and the rice ration raised from six to ten ounces per capita per day for patients on full diet.

	Year 1938	Year 1946	Year 1947
	$ c.	$ c.	$ c.
1st Class	1 34	4 28	3 04
2nd Class	0 99	3 76	2 60
3rd Class	0 26	0 79	0 72

The Dental Clinic forms part of the clinical teaching section of the Dental Department of the King Edward VII College of Medicine. During the year it continued to be handicapped through lack of equipment, particularly hand instruments, and shortage of staff. Consequently the number of patients treated was limited, although the provision of dentures showed a marked increase over 1946, made possible by a number of pupil dental mechanics undergoing training.

As in 1946, patients came to the clinic for treatment following work by unregistered dentists. Fortunately only one case proved fatal. There was also a large number of jaw injuries caused through accidents, and a twenty-four hour service has been arranged for such cases. Unfortunately there was still no provision for a dental service for school children. This has been mentioned elsewhere in this report and this lack will be remedied for the first time in 1948.

Outpatient Department: A classification of outpatient attendances at separate clinics will be found in Appendix *XV*.

2. Special Departments

(i) OPHTHALMOLOGY

In spite of shortage of medical, nursing and ancillary staff, it has been possible to maintain a very high standard of efficiency both in clinical work and in teaching. The pressure of work, however, has made it impossible to carry out any research or even to maintain really comprehensive case records. As soon as staff becomes available, the first task will be to carry out detailed clinical surveys of the ophthalmic conditions met with in this country and to correlate these with similar surveys elsewhere.

Major operative work continued to increase, particularly in cataract operations. The unit continued to attract numbers of patients of all classes from a wide radius, including Sumatra, Sarawak and Borneo, where no ophthalmic facilities exist.

In 1946 it was stated that keratomalacia was almost totally absent. There has been a remarkable and significant increase of this condition in 1947, a state of affairs whereby a destructive occular condition in children is considered to be due to improper feeding with sweetened condensed milk lacking in Vitamin *A*.

Reference was made to trachoma in the 1946 report, the impression being recorded that it had not noticeably increased during the war years. This impression was strengthened by clinical experience throughout 1947. Trachoma is a disease which in individuals and races tends to die out in this country; it is kept alive in Malaya only by infected immigrants. It is believed that improved housing and hygiene, added to strict control of immigrants, would be sufficient to reduce this condition to negligible proportions within a generation.

A locally qualified medical officer has been intensively trained during the year and is to go to Great Britain for further study and qualifications under a Queen's scholarship.

No change has been made in the pre-war accommodation available for outpatients, wards and theatres, but plans have been completed and approved for housing the unit as a whole and it is expected that work will shortly commence.

Teaching was carried out throughout the year; the usual course of lectures was given and clinical training was afforded to a larger number of students than ever before. Each student attends daily for a month and, in addition to clinical tuition, is given the opportunity, under supervision, to carry out minor operative procedures.

(ii) MATERNITY AND GYNÆCOLOGY

The Kandang Kerbau Hospital continued to be reserved for these conditions, 220 beds excluding cots being available by the end of the year. The following points of particular interest can be recorded during the year under review.

(1) increase in numbers in every section;

(2) decrease in mortality both in the midwifery and gynæcological sections;

(3) the increase in number of abnormal labours which shows that the clinics, both Rural and Municipal, are functioning better;

(4) the starting of a post-natal clinic and its acceptance by the public.

Increase in numbers: In 1947, 8,271 pregnant women over 6 months (those under that period of pregnancy were admitted to the gynæcological wards) were admitted as compared with 5,906 in 1946. One thousand seven hundred and four cases were admitted to the gynæcological wards and 1,155 were operated on as compared with 1,455 and 1,073 respectively in 1946. These are very large numbers for a hospital of this size. Trained staff again is desperately short. At the beginning of the year, as a new venture, a post-natal outpatients department was opened where advice could be given to mothers. That it proved a success is certainly evident by the 19,930 attendances and most mothers brought their babies up regularly in addition.

Five antenatal and gynæcological outpatient clinics work three days a week. There were 24,683 attendances, of which 7,033 were "new cases". Of these "new cases" 4,301 were antenatal. The routine clinical laboratory carried out 15,893 examinations—examinations of urine, blood, fæces, etc.

Decrease in mortality rates: The mortality in the midwifery section was 0.92% of total deliveries and 0.87% of total admissions compared with 1.34% and 1.17% respectively in 1946. These are larger figures than those usually recorded in England but all the difficult labours occurring on the district are sent into this hospital as soon as recognised and these often require a great deal of persuasion thus causing serious delay. During the year 5,215 cases were attended to by the Rural Health Clinics without a single death. There was a big increase in abnormal deliveries from 661 to 1,541, due in the main to the better functioning of clinics. In gynæcological cases the mortality was 1.7% compared with 2.4%.

Teaching: Seventeen medical students completed their three months' course of practical midwifery. On the average they delivered 37 cases each. All delivered a breech presentation and applied forceps at least once. Unfortunately it was not possible to have these students in hospital but accommodation is nearby and when on duty they can sleep in the building. Systematic and clinical lectures continued throughout the year.

Nurses and Pupil Midwives: Forty-two nurses and pupil midwives completed their training and passed their examination for the diploma or certificate of the Central Midwives Board. Pupil Midwives now have to spend six weeks at one of the Rural Health Centres during their year's course and so obtain a practical knowledge of domiciliary midwifery and the running of ante-natal and post-natal clinics in the "kampong".

There was a persistent and growing public demand for paying class accommodation but this had to be limited to prevent any interference with poorer patients. Hospitalisation is as necessary for midwifery in this country as in Europe, a conclusion which applies to all sections of the population.

It is not out of place to recall here the difficulties met with in the early stages of this work, and the following is extracted from a report by Professor J. S. English, who is retiring in 1948 after twenty-six years of endeavour in this country:

"Until 1924 nearly all students' practical work was done at a Maternity Hospital in the grounds of the General Hospital. The Free Maternity Hospital had been opened in 1884 by Sir Frederick Weld, then Governor of Singapore, in the gate house of the old prison at the junction of Victoria Street and Stamford Road where Raffles Girls School now stands. Its history is obscure except that there is recollection of it closing down on more than one occasion. This hospital provided 16 beds and 2 stretchers, and an outdoor dispensary was held in one of the ground floor rooms. Apparently considerable importance was attached to this fact as, at a meeting in 1906, it was pointed out that "the interests of the outdoor dispensary must be kept in mind when any enlargement of the maternity side of the building was being contemplated". At about the same time it was officially stated at a Medical School Council Meeting that a proper maternity hospital would attract the Chinese, very few of whom were then being admitted, most of the patients being European, Eurasian and Tamil. This can be looked upon as an interesting observation in view of the present figure of 85–90% Chinese admissions.

It was apparently difficult for students in the Medical School to deliver the requisite 20 cases for the Council gave a grant to pregnant women who allowed themselves to be attended by students during their confinement. This continued until 1912.

Until 1922, when I came out, the midwifery was looked after by "someone" from the General Hospital who chanced not to be busy. In another phase there was a roster of doctors in General Practice who gave their services free when called on by the Sister-in-Charge. It grew in size and at times was terribly overcrowded till October, 1924 when we moved to the present site at Kandang Kerbau, where the buildings had served Singapore in turn as the General Hospital, female Leper Camp and a female lock hospital. Here we had 34 beds. In time these too soon became insufficient for the demand and one old building was pulled down and a block with 120 beds erected in 1934. Again we overgrew and another block built on the site of the other bungalow contained ante-natal, labour wards and some lying-in beds, bringing the total up to 180 in July, 1940 when it was opened.

With the advent of the Japanese it was converted into an Emergency General Hospital with 500 beds and was used during the Occupation as the Civil General Hospital, Singapore, and so it remained till June, 1946 when all classes of both maternity and gynæcology were housed there. The extension of the hospital building is an urgent necessity. Accommodation for sisters, nurses, pupil midwives and menial staff is also urgently required.

The following deliveries were recorded through the years:—

1915	174	
1916	195	
1917	206	
1918	221	
1919	232	
1920	342	
1921	496	
1922	466	
1923	797	
1924	688	(moved to a new site)
1925	588	
1926	753	
1927	1,019	
1928	1,304	
1929	1,606	
1930	1,882	
1931	1,955	
1932	2,146	
1933	2,306	
1934	2,575	
1935	3,548	
1936	4,707	
1937	5,214	
1938	5,551	
1939	6,034	
1940	6,184	
1941	6,425	(only 300 in December)
1942	1,913	(Japanese Occupation)
1943	2,037	
1944	1,657	
1945	1,584	
1946	5,101	
1947	7,802	

The fear of hospitals seems to have largely disappeared and the advantages appreciated, especially antenatal supervision, as shewn by the enormous increases in attendances at clinics. In 1921 there was practically no antenatal supervision of any kind, and last year 24,000 attendances were recorded. However there can be no reduction of effort until all pregnant women are seen antenatally and until mortality only occurs amongst those who die from some accidental or intercurrent disease or those who should not have become pregnant.

Mortality in 1947 was lower—0.92% of total deliveries but a fairer figure is 0.87% of total admissions as many are admitted moribund or die undelivered. This is a decrease on 1946 (1.17%) and on the 1939 figure (1.6%) and all abnormal midwifery on the district is sent in. The number of cases admitted aborting is also increased and this shows a growing confidence in the hospital.

From experience in this field the following conclusions have been drawn:—

(1) The increase of desire for antenatal supervision—this is probably the most striking change.

(2) The enormous increase in the number of cases aborting or, having aborted, desiring curettage (340 in 1947 as compared with 97 in 1939) as they now appreciate the importance of that small operation.

(3) The number of "destructive" operations on the child (decapitation, etc.) have almost disappeared (only 1 in 1947 compared with 8 in 1939).

(4) The Cæsaran Section figure (20 to 30 per annum) remains the same—a low percentage compared with many countries.

(5) Two hundred and thirteen is also a low figure for delivery with forceps, which is probably due to absence of minor degrees of contraction and a more normal type of patient.

(6) Beri-beri also showed a marked decrease, there being 11 cases with no maternal deaths.

(7) Eclampsia was slightly lower in incidence than before but with efficient antenatal supervision the opinion is that this could be reduced further (0.60% in 1947 compared with 0.98% in 1946).

(8) Transverse presentations are also reduced (0.30% in 1947 compared with 0.64% in 1946)".

(iii) Venereal Disease

That the particular attention which has been paid to the question of venereal disease in women in Singapore has resulted in a very satisfactory advance in the number of cases coming up for treatment must be obvious from a study of the following figures:—

New Cases	*1939*	*1947*		
Females	851	2,540	2,268	Middle Road
			272	Other Hospitals

During 1947 a most satisfactory development has been the increasing number of attendances of housewives who have been coming forward completely voluntarily to seek treatment. Many of these women are suffering from latent syphilis and numbers have brought their congenitally syphilitic offspring with them, many of them having been so impressed by the dramatic effect of antisyphilitic treatment (penicillin) on the infant of some neighbour or acquaintance that they have overcome their natural reluctance to seek advice.

Ten beds were set up in a special detention ward set aside for the investigation and treatment of girls of under 18 years of age arrested by the Police under the Women and Girls Protection Ordinance. Middle Road Hospital has been declared a place of safety under the Ordinance and girls are brought for investigation immediately on arrest. If investigation shows no evidence of venereal disease, the girls are transferred to the Social Welfare Detention Home at Pasir Panjang, while those having contracted it are detained in Middle Road Hospital until treatment is established and the girl is no longer a potential source of infection to her companions. For subsequent outpatient treatment and surveillance the girls are brought to hospital under escort on specified days.

This satisfactory development of increasing numbers has been assisted considerably by the propaganda spread during personal visits by the Senior Supervisor and her small staff of two full time visitors. (To be increased next year). The duties of the Senior Supervisor and two supervisors are outdoor, house-to-house propaganda, case-contacting and case-holding—frequently an extremely difficult task with people who use a number of names and addresses. Liaison is maintained with the Services through their venereologists and through the anti-vice section of the Military Police. The procedure, at present, is that the venereologist gives facilities for the Military Police to interview the Service personnel infected with venereal disease. At this interview, name and address (if possible) of the probable source of infection are obtained. Every effort is then made, both by the Military Police and the Senior Supervisor and staff to trace, contact and persuade to attend for examination the woman who is suspect. By this means 246 women were brought to examination in the course of 1947.

That these satisfactory figures do not necessarily mean an increase in the incidence of the disease in Singapore but refer to the new methods of approach and treatment should be clear from the fact that so far the number of men coming up is less than the pre-war.

Total New Cases	*1939*	*1947*		
Males	9,586	8,065	6,787	Middle Road
			1,278	Other Hospitals

An increased attention will now be paid to the male side of the picture during the coming year in consequence.

The progress in this work since the re-occupation is evidenced by the increase in the total number of cases treated from 33,000 in 1946 to 50,000 in 1947.

A hospital (Middle Road) with a bed strength up to 60 is maintained in the centre of the town for inpatients, with 30 beds for adult females, 20 for adult males, 8 cots for babies and 10 beds for girls on warrant under the Women and Girls Protection Ordinance. This number of beds means serious overcrowding however and a good deal more work could be done immediately if a much larger and more suitable building was available. Nevertheless, it is doing a noble work outmoded as it is and will have to suffice until a solution to the staffing problem has been evolved.

Outpatient clinics for both sexes are functioning in this building and, in addition, there is a male clinic in the dock area (Tanjong Pagar).

The hospital building is ideally situated for its present purpose and it is clear that such a situation reserved for social hygiene meets local requirements as far as the poorer section of the population is concerned. The place is now well known and is becoming universally popular. The only deterrents to rapid increase in inpatients and outpatients is the size of the building and the smallness of the staff.

In the course of the year there has been admitted for treatment as inpatients to Middle Road Hospital 1,654 women and children and 475 men.

Outpatient attendances for the same period at all venereal disease clinics have been 10,046 women and children, of whom 2,497 were new cases and 36,744 males, of whom 7,647 were new cases. Outpatient clinics are held at Middle Road Hospital daily except on Sundays and at Tanjong Pagar Clinic on Monday, Wednesday and Friday afternoons and on Tuesday and Thursday evenings. It is expected that evening clinics will be held at Middle Road Hospital in the near future.

A total of 9,055 new cases classified by nationality showed the following distribution:—

Nationality	*Male*	*Female*	*Total*
Chinese	3,828	1,849	5,677
Indians	1,962	147	2,109
Malays	554	218	772
Eurasians	74	33	107
Europeans	256	—	256
Indonesians	54	—	54
Others	59	21	80
	6,787	2,268	9,055

A number of alterations and additions have been made to the hospital buildings including the extension of kitchen facilities, provision of hot and cold running water in both male and female examination rooms, and the installation of ceiling fans in wards and clinics. In addition, the Nurses' Quarters have been furnished and furniture is on order for wards, clinic, laboratory, dispensary and duty rooms.

Penicillin has remained the drug of choice in the treatment of both syphilis and gonorrhœa, a total 3,086 patients having been treated during the year. Dosage has varied from 250,000 units in the case of an uncomplicated acute gonorrhœa to 6 megaunits in the case of a late syphilitic with tabes dorsalis. Aqueous solutions of penicillin given 3 hourly night and day have been used, the impression being that the results are better than with massive single injection of aqueous solution. A very small supply of penicillin in oil and beeswax became available in ampoules of 300,000 units each. A few cases of acute complicated gonorrhœa were treated by the intramuscular injection of one ampoule with satisfactory results. When this preparation becomes more readily available it should prove of inestimable value in the treatment of the acute uncomplicated case who is reluctant to undergo inpatient treatment. This, however, will in no way ease our need for beds as there will always be a large number of complications requiring impatient treatment.

Streptomycin has not been used so far here as no case has been encountered which has not eventually responded to the various treatment procedures already at out disposal.

In conjunction with penicillin, sulphathiazol and sulphadiazine have been used extensively in the treatment of gonorrhœa and, in the case of syphilis, practically all cases have been given at least one full course of treatment with arsenic and bismuth following penicillin.

The general impression of the results of treatment remain on the whole the same. It has been found that the concurrent administration of penicillin with a sulphonamide appears to produce more satisfactory results than the administration of either alone.

The clinical response to penicillin therapy in cases of congenital syphilis continues to be dramatic, improvement becoming apparent in a matter of hours in many cases. Of the 233 cases treated during the year, 3 died (1.28%) while under treatment. These three cases, however, were moribund on admission to hospital. The co-operation of the mothers with regard to attendances after discharge from hospital has been excellent, most of the infants having had a subsequent course of intramuscular acetylarsen. A few who had received a somewhat low total dosage of penicillin in the first place were readmitted for further penicillin therapy on showing signs of clinical relapse.

Cases of secondary syphilis showed a marked tendency to serological relapse after penicillin alone and all except defaulters had arsenic and bismuth therapy following penicillin. In late syphilis clinical improvement was not followed as a rule by serological improvement, though C.S.F. findings were more satisfactory.

Clinical teaching in venereal disease is carried out in Middle Road Hospital. Usually four students at a time are allotted to this hospital for a period of one month. During this time each student spends two weeks in the male outpatient section and wards and two weeks in the female section. The students do clinical examinations including the taking of smears for Gonococci, slides for dark ground examination and the taking of specimens of blood for serological examination, as well as carrying out treatment under the supervision of the medical officer. They also take part in the routine laboratory work of the Clinic. The Senior Medical Officer delivers lectures on venereal disease once weekly to medical students, covering two terms at the King Edward VII College of Medicine. Dental students have a separate course of six lecture demonstrations, normally given at Middle Road Hospital. Clinical material is plentiful and varied and students appear to take a keen interest in the work.

The staff consists of:—

Doctors (full time)	2
Doctors (part time)	1
Senior Supervisor	1
Visitors	2
Nurses	10
Male Hospital Assistants	14
Male Attendants (including 1 jaga + 3 cooks) ..	19
Female Attendants	11

The following table shows the type of venereal disease treated at the Social Hygiene Hospital during the period under review:

	INPATIENTS			OUTPATIENTS NEW CASES			OUTPATIENTS REPETITIONS			OUTPATIENTS TOTAL ATTENDANCES		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Syphilis:—												
1. Primary	102	..	102	490	143	633	3,245	..	3,245	3,735	143	3,878
2. Secondary	224	126	350	1,443	432	1,875	8,866	373	9,239	10,309	805	11,114
3. Tertiary	23	209	232	84	221	305	974	457	1,431	1,058	678	1,736
4. Hereditary ..	2	114	116	4	168	172	112	233	345	116	401	517
5. Period not indicated ..	..	334	334	93	155	248	1,268	1,993	3,261	1,361	2,148	3,509
Other Venereal Diseases:—												
1. Soft Chancre ..	37	54	91	1,270	54	1,324	4,717	197	4,914	5,987	251	6,238
2. Gonorrhoea ..	25	569	594	2,659	987	3,646	5,678	2,483	8,161	8,337	3,470	11,807
3. Gonorrhoeal Ophthalmia	..	30	30	11	30	41	74	88	162	85	118	203
4. Other Gonorrheoal complications	57	51	108	216	51	267	402	432	834	618	483	1,101
5. Granuloma Venereum ..	..	3	3	..	3	3	..	21	21	..	24	24
6. Tropical Bubo ..	1	24	25	16	24	40	84	298	382	100	322	422
7. Mixed Infection ..	4	140	144	26	..	26	512	896	1,408	538	896	1,434
Tanjong Pagar Clinic ..	..	..	..	..	..	..	2,532	..	2,532	2,532	..	2,532
Referred elsewhere ..	..	..	..	475	..	475	..	..	..	475	..	475
Total ..	475	1,654	2,129	6,787	2,268	9,055	28,464	7,471	35,935	35,251	9,739	44,990

(iv) LEPROSY

The staff of the Leper Settlement consists of a visiting medical officer, a resident hospital assistant, two hospital attendants and three watchmen. At the end of the year there were thirty-one male inmate workers and thirty female workers who received a small allowance for their work in the camp. The number of patients cared for by this staff is as follows:—

	Male	*Female*	*Total*
Patients in Camp 31–12–47 ..	210	137	347
Admissions in 1947 ..	116	44	160
Deaths	11	6	17
Transferred	60	60	120

The general state of the Settlement both from the point of view of physical appearance and the morale of its inmates continued to leave much to be desired at the beginning of the period under review. This unhappy condition was due largely to the period of the Japanese Occupation when life there became extremely difficult and each had to fend for himself, this resulting in a difficult and suspicious state of mind in the inmates. Delay in rehabilitation when so many other sections of the Department had to take a prior claim also had its effect. Overcrowding by admission of new inmates gathered in after the re-occupation did not make the task easier; added to which post-war inflation has made the allowance paid to workers practically valueless and consequently the stronger and more industrious individuals were attracted to more lucrative occupation such as gardening and black marketing. The whole Settlement called for radical reorganisation and to this end a scheme of rehabilitation was pushed ahead.

As no help in securing additional personnel could be expected from outside the camp in view of the many commitments elsewhere, it was essential to train extra staff to assist in the proper running of the camp, one of the most urgent needs being the establishment of proper wards for the treatment of the acutely sick. Thus six female and seven male English speaking inmates were recruited to train as nurses and hospital assistants and the Settlement is deeply indebted to a former nursing sister for coming to the camp to give lectures and practical instruction in nursing. A course of lectures in elementary and practical medical subjects was also given by the Medical Officer in Charge. The matron of Tan Tock Seng Hospital paid weekly visits and helped to organise and equip the hospital wards of the Settlement. By the close of the year the hospitals in the two camps were functioning efficiently and a good in and outpatient service was established for the inmates.

Government was approached for an increased allocation to pay inmates an allowance more in keeping with the purchasing power of the dollar and a scheme was prepared which followed closely the rate of renumeration paid in the Sungei Buloh Settlement in the Federation of Malaya. The number of inmates to be employed was also increased so that the sick could be properly cared for and the grounds and buildings of the camp kept clean and tidy.

Rehabilitation of the grounds has gone ahead. All the lallang inside the walls of the camp has been dug out and grass lawns are replacing the former derelict gardens. Trees have been planted and the air of the entire Settlement has taken on a welcome change for the better.

Experience has shewn that the effect of the enemy occupation on the spread of this disease is likely to mean more accommodation for its treatment than that required before the war. Prior to the war Singapore acted as a transit camp to the larger and better equipped Settlements up country. As it is now certain that this increase in cases has rendered an additional place for Singapore's lepers imperative, a scheme is under preparation for the extension of the Singapore Settlement along the individual accommodation lines of Sungei Buloh to accommodate all the lepers from the Colony on Singapore Island up to a total of some 600. The scheme envisages the building of sufficient accommodation each year to hold all new patients.

No new buildings were put up during the year but the Public Works Department carried out repairs and partial rehabilitation of wards in the Settlement.

The school for inmate children has had a rather chequered year; while a devoted worker in Miss Buxton continued her invaluable services it was recognised that the school's greatest need is for trained teachers and there is a grave danger of the system breaking down if the inmate teachers cannot get the necessary training to help them to organise on more satisfactory lines. The matter is having urgent attention as there are 62 leper children in the Settlement.

During the latter part of the year a number of interested people formed themselves into an unofficial committee to organise and assist in supplying amenities to the lepers in Singapore. Its general status was recognised by Government and its title "Leper Welfare Committee" approved. The Committee raises funds and helps to organise amenities for the camp. Its activities in 1947 included raising funds for an extra meal to celebrate Princess Elizabeth's wedding and a party for the inmates at Christmas at which every inmate received a gift. It also provided a new radio and a sewing machine for the women's camp.

The various religious communities and Toc H continued to give valuable help. Their efforts will in future be coordinated by the Leper Welfare Committee.

Treatment: Weekly intramuscular injection of Oleum Hydnocarpus was routine. Towards the end of the year supplies became difficult owing to one shipment of oil from India containing a high proportion of peroxides. Moogrol (B & W) was then used. Despite very cautious dosage it gave rise to a high proportion of reactions and many cases had to discontinue treatment until Oleum Hydnocarpus again became available.

A small amount of promin was obtained for experimental purposes and two cases were selected and transferred to Tan Tock Seng Hospital where the treatment was carried out. At the end of the year there were as yet no dramatic changes but the depressing effect of this drug on the hæmopoietic system was noted in one case. This experiment has been in progress for only 3 months.

Arrangements have been made for a supply of sulphetrone and diasone. An extensive trial of these drugs will be made next year in addition to continuing the trial of cases already on promin.

Diet: This is the same as the third class diet in all Government Hospitals except that the rice ration was 8 ozs. instead of 6 ozs. and in December all hospitals were raised to 10 ozs.

(v) INFECTIOUS DISEASE

The total number of infectious disease cases treated in Middleton Hospital during the year amounted to 1,448. This figure includes a few contacts and query carriers.

The epidemic of smallpox which commenced in May, 1946 continued during January and February and then abated, there being only one case in March. Of the total 41 cases admitted 11 died.

No cases of cholera or plague were reported. There were 57 cases of typhoid, 2 cases of paratyphoid "A", one case of tropical typhus, 94 cases of dysentery, 154 cases of diphtheria and 15 cases of cerebro-spinal meningitis. In addition 191 cases of mumps were admitted.

Of the 154 cases of diphtheria dealt with, 38 required immediate tracheotomy. Twenty-three of the total cases died, all deaths occurring in Chinese children under five years of age, just under 74% within 24 hours of admission. The types of diphtheria were classified as follows:—

	Admitted	*Died*
Laryngeal and Tracheal	63	14
Nasopharyngeal	19	7
Faucial	51	2
Nasal	3	—
Contact-Carrier	18	—
	154	23

(vi) MENTAL DISEASE

Steady progress has been made in the rehabilitation of the Mental Hospital which has been restored to the extent of accommodating 900 patients. Buildings were repaired, painted and made habitable; boilers and steam cockers were overhauled; sanitary installations, which had suffered particular neglect, were put in working order and much time and effort was devoted to the cleaning and tidying of the hospital grounds and garden. The number of patients under treatment increased steadily throughout the year and, as an aftermath of the Japanese Occupation, this may be expected to continue for some time to come. There were 669 patients remaining in hospital at 31st December, 1947.

As pre-war, the most frequently encountered mental illness was the toxic-confusional syndrome, while a higher proportion than before of schizoid reaction type psychoses was noted. Late in the year electrical apparatus for administering shock therapy was obtained from England and the treatment of selected cases begun but it is considered too early to indicate results.

Gardening provided occupational therapy for certain male patients, female patients being encouraged to work in the sewing room.

The question of nursing in the Mental Hospital has been a subject of concern in that, apart from a small trained staff, reliance has always been placed in the past on selected hospital attendants whose skill and knowledge is far from what one would desire in this respect. Until satisfactory nursing recruitment has been established for acute medical and surgical disease, it is impossible to draft more fully trained nursing personnel to the non acute hospitals.

The following table indicates a 27% recovery in patients treated during the year:—

Sex	No. of patients remaining in hospital on 31-12-46	No. of patients admitted during 1947	No. of Patients Discharged during 1947				No. of patients died in 1947	No. of patients remaining on 31-12-47
			Recovered	Improved	Not improved.	Absconded		
Male	240	468	184	30	10	5	68	411
Female ..	142	305	138	18	6	..	27	258
Total ..	382	773	322	48	16	5	95	669

(vii) PATHOLOGY

The work of this division of the Medical Department includes:—

1. Post-mortem examinations (Coroner's cases and clinical cases) at the General, Tan Tock Seng and Kandang Kerbau Hospitals.
2. Histological examination of biopsy and autopsy material from the above hospitals.
3. Bacteriological investigations of specimens from the Government hospitals, dispensaries and clinics.
4. Serological tests in bloods and cerebro-spinal fluids from the hospitals, dispensaries and clinics.
5. The various duties in connection with the Blood Transfusion Service.
6. Teaching in Pathology to Medical and Dental students (lectures and practical classes).
7. Teaching of Forsenic Medicine to Medical students (lectures and practical classes).

The account of the work done in this laboratory is not representative of Singapore as a whole because similar examinations are done at the Municipal and Command Laboratories. Further the hospital laboratories undertake certain pathological, biochemical and hæmatological investigations.

The Pathology Division has been understaffed throughout the year while there has been a difficulty in obtaining the various apparatus, chemicals, glassware and so on which were ordered in the "rehabilitation indent" and the indents of 1946. Only a limited quantity of material was obtainable from the Medical Stores and from the local market, barely sufficient for day to day requirements and of poor quality. Thus the work was carried on under extreme difficulty.

Teaching: The teaching of students in Pathology and Forsenic Medicine was carried out throughout the year. As more than fifty per cent. of the time of the Pathologist had to be devoted to the teaching of students—preparation of lectures, demonstrations, preparation of material for practical classes, and morbid anatomy (post-mortems) additional staff is essential for this purpose. It is hoped that staff asked for in 1948 for this and other purposes will be available so that the department can be developed and brought up to date.

Blood Transfusion Service: The Blood Transfusion Service brought in more work to an already understaffed department. It is hoped that in the very near future the full time officer already asked for to take charge of this service will be available as the work done by this branch is of incalculable value to a hospital organisation. A number of voluntary workers have helped the service; it would be almost impossible to run it with any efficiency without this invaluable help. As it is, only four full time supervisors and technicians are at the disposal of the Pathologist. A Ford "V" 8 station waggon was supplied to the unit during the year and this has been most useful in the collection and dispersal of blood donors requiring transport and also for propaganda work and the present weekly visit to the Army Hospital.

A panel of donors is maintained by personal contact and propaganda work in which the Public Relations Department is called in, as is the Press. The response from the local population continues to be very disheartening. A large number of donors have been rejected as unfit. This lack of response may necessitate the use of a fee to donors in due course. Records are kept in connection with the taking and distribution of blood, arrangement of bleeding sessions, transport of donors, etc. While the work increased considerably over the period it is clear that an essential service cannot continue to expand under these conditions.

Technical: This side covers a wide field and requires a considerable degree of specialised knowledge, such as the proper cleaning and sterilising of glassware and rubber tubing: the grouping and matching of blood: the preparation and maintenance of blood giving and blood taking sets: the preparation of pyrogen-free distilled water: taking and storing of blood.

There was some temporary improvement in the public response subsequent to two propaganda campaigns—one at the "Cathay" in May and the other at the "Great World Trade Fair" at the end of August. The donor panel increased by 190 after the former and to 300 after the latter. The Army Medical authorities continued to be extremely helpful to the service throughout and at present bleedings are performed at the Alexandra Military Hospital once per week and are attended by members of the Civil Transfusion Staff who take with them the necessary equipment. Naturally a proportion of the blood collected is retained by the Army for its own use. (*See* Appendix *XII* for details of work done).

Post Mortem Examinations: During the year 1,047 post-mortem examinations were done, out of which 758 were coroner's cases. The latter forms 72% of the total number of post-mortems, a percentage which compares with the previous year. There has been no marked decrease in the number of coroner's cases.

On a comparison of causes of death with the 1946 figures the following points of interest emerge:

Deaths from malaria showed a marked decrease: 24 in 1946 and 11 in 1947. Deaths from protozoal disease: helminthiasis increased from 5 in 1946 to 28 in 1947.

Deaths from motor vehicle accidents (137); suicidal hangings (62); injuries from fire-arms (41); caustic soda poisoning (18) do not show any appreciable difference from 1946.

Four labourers died of asphyxia from carbon dioxide in the hold of a ship in Singapore Harbour. The ship contained a cargo of oranges in crates. These are the first cases on record of deaths caused by carbon dioxide locally.

As 70% to 80% of the total autopsies are coroner's cases, the full time appointment of a medico-legal officer as early as possible needs no further emphasis. There is more than enough work for one officer with the necessary staff in this respect if teaching is added to the duty.

Histology: The number of histological sections examined during the year was 1,860, an increase of 692 over the 1946 figure (1,168). The only noteworthy increase was in the number of breast (female) tumours—malignant 22, benign 14, the respective figures for 1946 being 8 and 2. The "cell block" technique on pleural and ascitic fluids for malignant cells is being carried out for the first time in this laboratory. A fairly representative collection of histological slides (70 sets) for teaching has been prepared during the year.

Bacteriology: The following points of interest arise from bacteriological investigation during the year:—

1. Specimens from a shipload of 314 pilgrims were examined for cholera but in no case was a positive finding recorded.
2. Pfeifferella whitmori was isolated from the lung and spleen of a case of melidosis (autopsy).
3. Actinomyces bovis was isolated in five cases from such sources as pleural fluid, sinus of jaw, sinus of chest.
4. Two guinea pigs inoculated intraperitoneally with blood from patients suffering from Well's Disease died, showing a classical picture at post-mortem, and L. Icterohæmorrhagica was present in sections of the various organs.

Serology: The number of bloods and cerebro-spinal fluids received for Kahn tests was 20,404 and 466 respectively and these show an almost 100% increase over the 1946 figures. There were 4,484 positive results. A summary of examinations carried out by this department will be seen in Appendix *XVI.*

(viii) TUBERCULOSIS

(Tan Tock Seng and Orthopædic Hospitals). While Tan Tock Seng continued to act as a subsidiary to the General Hospital throughout the year, in that convalescent, chronic and incurable medical and surgical cases (with some acute medical) were transferred as soon as possible from the latter institution, which is the major acute and accident inpatient centre of the Colony, tuberculosis became the chief disease dealt with there. In fact by the end of the year Tan Tock Seng had become the tuberculosis centre in the course of the policy which is to turn it into a complete tuberculosis hospital as soon as the general bed strength of the Department permits. Out of 530 beds in use in December 326 were in action for tuberculosis; 800 beds will finally be available. So this report merely takes us to the end of the first phase.

The tuberculosis policy of the department covers all the known avenues of approach to the problem. It is based principally on centralised clinic treatment centres, hospitalisation and domiciliary relief and treatment schemes. As a glance at the future plan will indicate, hospitalisation must be of a somewhat slow and cautious progress in view of the very low degree of bed strength available to the Colony in other directions, particularly for acute disease. Thus a concentration on a clinic and a domiciliary advance within the hospital scheme must be the present chief aim. This will be done through a rapid improvement in the outpatient approach at Tan Tock Seng through the generosity and foresight of the Rotary Club, which is helping to establish an up-to-date diagnostic and treatment centre in the very near future. A further advance in this direction will be the new Outpatient Department of the General Hospital.

It has been pointed out already that it is in the children in particular that the disease appears to have shewn a definite advance since the re-occupation. In consequence it is on this section of the population that action and intensive measures must be concentrated.

A fair start has been made in this direction by the child feeding scheme instituted by the British Military Administration, and since January, 1947 a permanent feature of the Social Welfare Department. A considerable advance on this scheme is called for to include children of all ages. We know that the child section of the population is the most vulnerable: that it has reacted most adversely to the Japanese Occupation and that it is the one with the latent ill health. The apparent serious increase in tuberculosis in our children is a sufficient indication of this. Child feeding is one of the main means at present to our hand. Thus more and more tuberculosis beds must be made available for children and, until actual hospital beds and staff can be furnished in any quantity, subsidiary organisations where children can lie and rest and eat will go a long way in the help required. This aspect of the problem is receiving consideration. The School Medical Service is obviously one of the most important sections of the Department in the tuberculosis field, as sooner or later all the children in the Colony will have to come under its administrative ken. A very rapid extension in the work of this Department is essential if the tuberculosis service is to be properly organised. Children of pre-school age can either be dealt with by an adequate extension of the

School Medical Service or a special service developed in the hospital clinic system. The latter procedure is favoured but a final decision still remains to be made. Domiciliary visitation and relief in various forms in connection with both the hospital and the school medical service has received additional attention during the year under review, patients from the former being dealt with through the Social Welfare Department. This aspect of the work is open to a very considerable increase in 1948 and special funds are being asked for, to be credited to the Social Welfare Department for hospital patients, and to the Health Division of the School Medical Service. An Almoner's Department is also to be organised. By these means tuberculous children who must continue to be treated at home will receive much needed nourishment and attention, and the families of patients suffering from tuberculosis, and even patients themselves, will not be left to starve after their disease has been diagnosed.

Attap and similar camps for tuberculosis patients have been suggested. As such schemes finally tend to become nothing but death camps and a public scandal, unless run on the most up-to-date lines with aid schemes for dependents—a very expensive solution—the idea is not one to be recommended. Properly run convalescent-sanatorium homes are another matter.

Tan Tock Seng Hospital: At the beginning of 1947 there were 226 cases of tuberculosis in the hospital—219 pulmonary and 7 surgical cases. Rehabilitation continued throughout the year, resulting in a total of 326 beds for tuberculosis cases, 56 of these being reserved for female cases and situated in the Mandalay Road section of the hospital.

This increase in accommodation was made possible in part by training convalescents to run their own wards. These cases are all such that while they are not sufficiently fit to return to an active earning life they are sufficiently well to help in the lighter chores of the ward. As more cases reach this stage it is intended to extend this scheme by opening another ward along the same lines.

In September a new diet scale was introduced for all tuberculosis cases. This replaced the third class diet and extras and the 2nd class diet which had been continued from the British Military Administration period for Government servants entitled to it, and for such other cases as the Medical Officer in Charge thought fit. This system was considered unsatisfactory in a free hospital and the Tan Tock Seng Hospital Committee at its July meeting approved the new scale from 1948 and empowered the Medical Officer to introduce it before the end of 1947, provided the provisions vote was not exceeded. By September an adequate surplus could be foreseen. The scale includes fish of better quality, butter 4 oz. per week, one pint of milk daily and two hen eggs in addition to vegetables of good quality and variety. It has thus been possible to supply a more varied and appetising diet of higher protein, vitamin and calorific value. This improvement has been appreciated by all patients who had found the fare extremely monotonous and difficult to take for the long period of hospitalisation required for treatment.

The total number of tuberculous admissions was 832; discharged 359; died 386. These figures are compared in the following table with those of 1946 and also 1938 when only two wards were in operation.

	1938	*1946*	*1947*
Total inpatients	1,114	1,148	1,048
Total beds	72	216	326
Admitted	1,042	907	832
Discharged	550	572	359
Deaths	420	357	386
Death rate	40.3%	31.09%	36.83%

The deaths occurred almost exclusively in the wards for advanced cases, which in 1946 were two in number and in 1947 three in number. The remainder of the accommodation housed those who had either shewn improvement or had been admitted for some special form of therapy.

The very much longer stay of patients in hospital now as compared to the pre-war procedure is a feature which is clearly brought out by the above figures. At that time 72 beds dealt with more patients than 326 cover now. Unless proper hospitalisation can be achieved little good can be expected from institutional treatment.

Admissions to the tuberculosis wards are controlled by the occurrence of vacancies either through discharges or deaths of patients. The figures for discharges plus deaths is lower than in 1946 so resultant vacancies for new admissions were fewer despite the increase in accommodation. The number of discharges of patients fit for duty according to medical standards is only a small proportion of those who took their discharges against advice.

At the beginning of the year there were 38 cases of artificial pneumothorax receiving treatment in hospital. These were accommodated separately in Tan Tock Seng Hospital and in Mandalay Road Hospital. At the end of the year there was a total of 52. In November and December 12 cases were treated with phrenic crush following pneumoperitoneum.

In the early part of the year 17 cases were treated with injection of myocrisin (sodium aurothiomalate). Results were inconclusive, some cases showing no improvement while others showed a marked drop in sedimentation rate and other signs of clinical improvement.

When a patient expressed the wish to be discharged before he was fit because of financial difficulties at home the assistance of the Social Welfare Department was sought and grants or allowances from the Silver Jubilee Fund were made available in cases which have been found to be deserving by the Social Welfare Department's investigation.

In May, 1947, the Artificial Pneumothorax Clinic was extended to take all cases of pulmonary tuberculosis whether referred from the Outpatient Department in Tan Tock Seng, General Hospital or from private practitioners. The accompanying chart demonstrates the increasing popularity of this clinic. Cases coming for treatment to the Tuberculosis Clinic almost without exception seek admission to the wards and judging from their description of their homes sanitorium treatment for all would appear most desirable. To assist in regulating admission to the hospital, cases are classified into three clinical groups each with its own waiting and priority list for the ward accommodation set aside for their respective types.

These groups are formed as follows:—

Firstly, the advanced bilateral case which is deteriorating rapidly and has on the whole a very gloomy prognosis. These are admitted as vacancies occur.

Secondly, chronic bilateral cases of reasonably high resistance but with lesions so distributed that collapse therapy is impossible and for whom only a very prolonged rest in bed offers any reasonably constructive treatment. A token allocation of one ward is available for this group which constitutes a large proportion of those who come for treatment. The great majority of these have to be treated as outpatients and admissions from this group are usually confined to those who develop severe hæmoptysis, spontaneous pneumothorax or some other emergency condition which demands immediate attention.

The third group is that which includes those early cases in which arrest or cure of the disease seems possible in a reasonably short time. It includes all unilateral cases and those bilateral cases which collapse therapy to the most affected side, pneumothorax or pneumoperitoneum following a phrenic crush may be expected to benefit. The normal routine for cases admitted to this group of wards is first a period of about one month's complete rest in bed before deciding on any form of collapse. Many cases have so improved that collapse, although practicable, has proved unnecessary. In cases where collapse is strongly indicated by reason of cavitation or hæmoptysis it is induced without delay.

During November and December a number of cases which were not suitable for pneumothorax by reason of their great activity or adherent pleura were treated with phrenic crush on the affected side followed by pneumoperitoneum. Results so far have been encouraging although it is too soon to form a definite opinion. This form of therapy is said to be especially valuable in cases where there is early hilar spread to the contralateral lung, as the raising of the diaphragm assists the healing of this lesion also.

In cases where collapse by artificial pneumothorax or pneumoperitoneum failed and the indication for collapse was imperative, patients were transferred to the General Hospital for thoracoplasty. One case in which apical cavities were held out by adherent pleura with repeated severe hæmoptysis is now fit enough for discharge and domiciliary treatment, and another in which multiple mid-zone cavities resulted in persistently positive sputum is nearly ready to return to work.

The lack of an operating theracoscope for the division of adhesions in pneumothorax cases was badly felt. This instrument has been on order for some time and is expected shortly. The number of incomplete collapses due to adhesions is considerable and in many has resulted in the appearance of effusions; in others to the abandoning of artificial pneumothorax treatment.

Outpatient treatment at the Clinic falls into two parts. Firstly the continuation of artificial pneumothorax refills and follow up control of cases discharged from the wards as fit either for domiciliary treatment or light duty. Secondly the examination of and supply of medicine for cases for whom no hospital accommodation exists at present and who must perforce rest at home whether domiciliary treatment is suitable or not. These cases were called into the wards as vacancies arose. Routine treatment has been with cod liver oil or vitamin oil (A & D) emulsion and sedative cough mixtures. Instruction is given on disinfection of sputum, etc. and separation from young children. In cases of financial difficulty the Social Welfare Department has been called in to help.

All cases coming to the Clinic in addition to physical examination receive routine tests of sputum and blood examination for sedimentation rate, hæmoglobin and leucocyte count. In all cases where it is considered necessary or desirable x-ray examination is carried out at the General Hospital as the present x-ray plant in Tan Tock Seng Hospital is only used for fluroscopy.

Planned extension of T.B. Clinic: In the 1948 estimates $125,000 has been set aside for a new Tuberculosis Diagnostic and Treatment Clinic, and to this allocation by Government the Rotary Club has added a further $100,000. The Club will put up the actual building, Government completing and running the organisation. This is to be sited in Tan Tock Seng Hospital and after it is built the present Clinic building will revert to its former function as a ward. By the end of 1947 all preliminary plans had been drawn up and it is hoped that the new clinic will be completed and functioning before the end of 1948. It will be called the Rotary Tuberculosis Clinic.

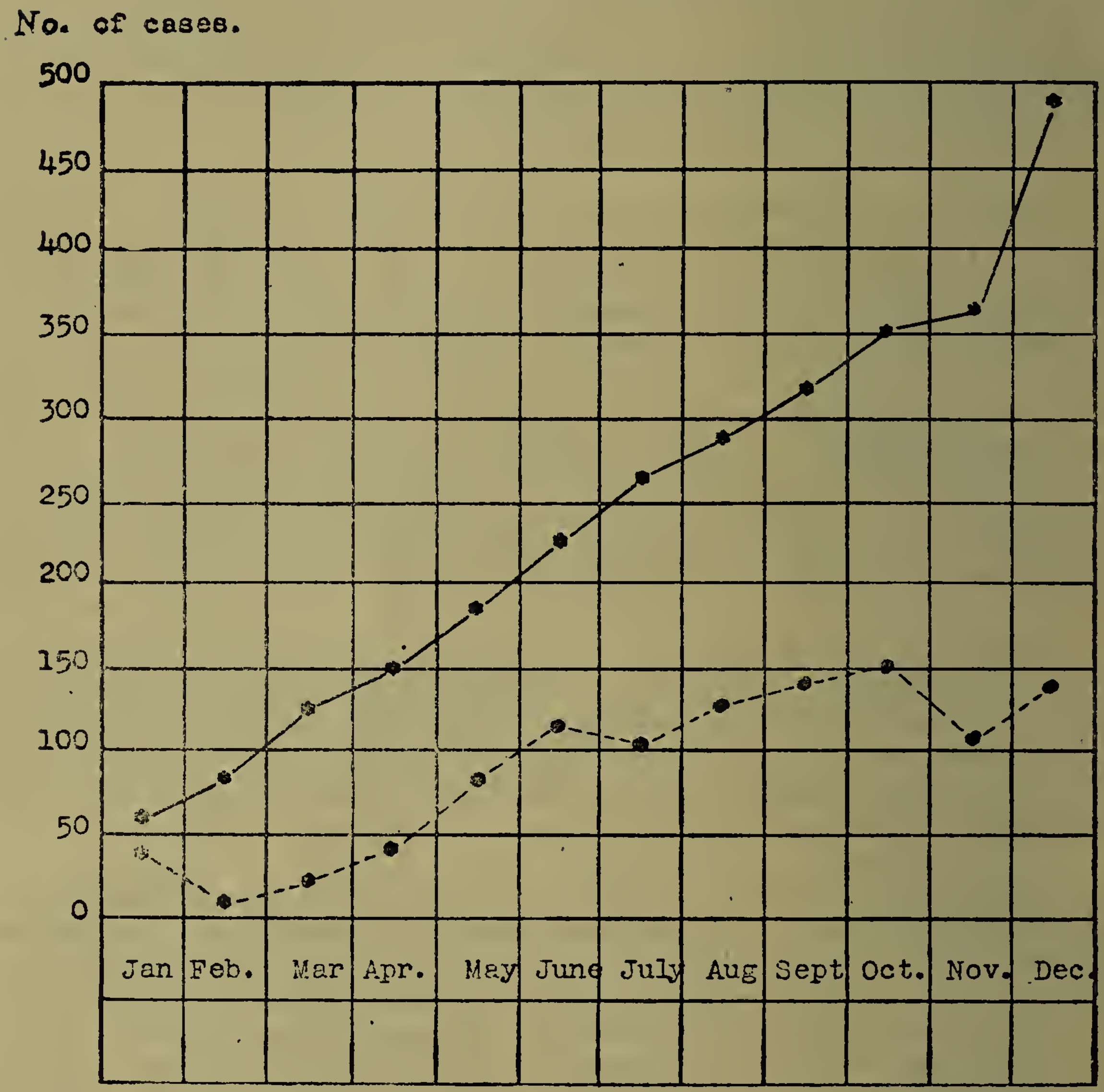
In November, a Schools Tuberculosis Clinic was opened in conjunction with the Schools Health Department. The cases are those suspected by the examining doctor, during routine inspections, to be tubercular. The Health Department collects and transports the cases to the hospital where they are fully examined and tested. Thirty-one cases have been dealt with up to date.

The Schools Health Department also undertakes a follow-up in the homes of the cases and a supply of fresh milk and soup concentrate is delivered to these patients daily. Defaulters at the Clinic are followed up and admission is arranged for suitable cases as vacancies occur.

Two charts showing Outpatient attendances and age distribution follow:—

Attendance at A.P. Clinic by Month in 1947

T.B. Out-Patient Attendance



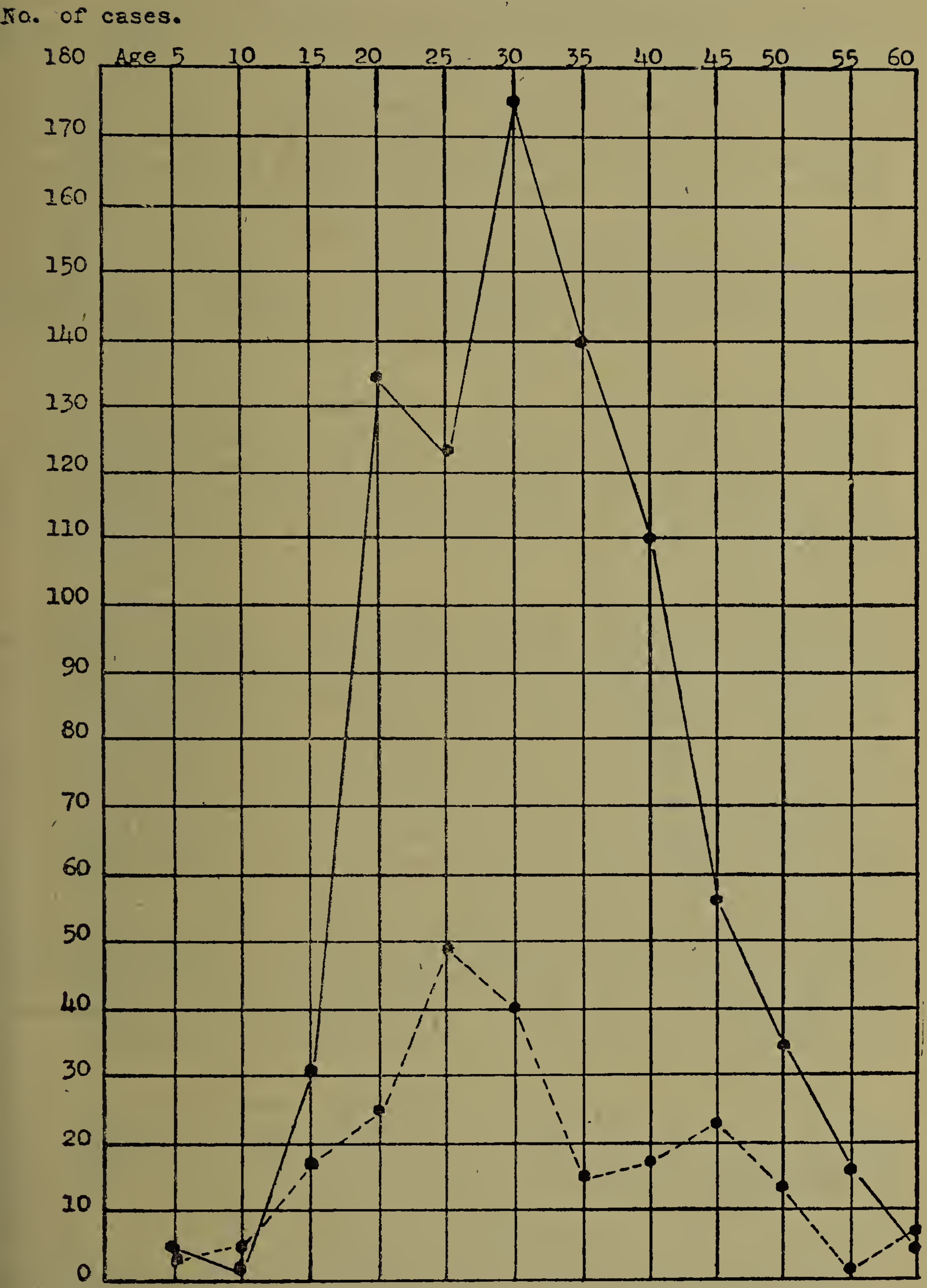
* Figs. for Jan. includes cases brought over from 1946.

Total Attendance at T.B. Clinic monthly . . . Full line ——*——

Total Monthly number of New Cases . . . Broken line - - - - * - - - -

Chart 1 shows the attendance figures of new and repeat cases of Pulmonary Tuberculosis at the Tuberculosis Clinic (and General O.P.D. for first 4 months.) The new cases are shown in broken line (*e.g.* - - - - * - - - -) and repeat cases in full line (*e.g.* ——*——). As will be seen the attendance figures for new cases show a sharp rise when the Clinic took over all Tuberculosis cases from the General Hospital out-patients. The number of new cases from June to the end of the year rising to and then averaging well over one hundred cases per month. The total attendance line demonstrates that these cases have continued in general to attend the Clinic and persist in their treatment. From the new cases plotted on the chart come all the admissions to the T.B. wards and discharged cases from the wards appear in total attendance group on their next attendance. The follow up has been very satisfactory, nearly all patients coming back to the Clinic for refills, check ups and medicine or, in the case of some more well to do, returning to their own doctors for further treatment.

AGE DISTRIBUTION OF T.B. CASES FOR 1947



MALES: Full line (*e.g.* ——*——) **FEMALES**: Broken line (*e.g.* ----*----).

Chart II shows the age incidence by sexes of all tuberculosis cases attending the O.P.D. and Tuberculosis Clinic for 1947. There is no similar record from previous years but this should serve as a useful comparison in the future. It will be seen that the highest incidence in males is around the age of 30 and for females slightly younger but the number in this latter group is considerably less and this may not be a significant finding.

The broad base of the curve is interesting in that it shows 170 males and 50 females of under 20, of whom 67 were under 15, found to be suffering from pulmonary tuberculosis. Next year this figure will be considerably higher as the Schools Health Department refer more cases to the Clinic and a concentration is made on children. Not all cases found by that Department in 1947 were referred as the Clinic only opened in November.

St. Andrew's Orthopaedic Hospital, Siglap; although owned by St. Andrew's Mission is for the present staffed and administered by the Medical Department. It admits cases of surgical tuberculosis. Treatment is also given to certain children who had suffered from acute poliomyelitis in the 1945/46 epidemic. This hospital is filled to capacity. In consequence admissions must be restricted. While the daily number of patients averages 65, up to 70 patients have been in residence at one time. New cases admitted during the year totalled 63.

Tuberculosis at the General Hospital: In addition to Tan Tock Seng Hospital 589 very acute cases were dealt with at the General Hospital during the year, 203 of them being children. Of the latter there were 109 cases with tubercular meningitis invariably a fatal condition.

Streptomycin and B.C.G.: The International Tuberculosis Convention at London during the year clearly indicated the position in regard to these methods of controlling tuberculosis. Streptomycin is still considered as an experimental drug, particularly useful in the more fatal forms of the disease such as the meningeal or the acute miliary types: the difficulties and limitations in the use of B.C.G. were revealed.

As the drug and the vaccine have received much publicity locally and both may be of considerable importance in the future control of tuberculosis in Singapore, a brief resumé of the position is undertaken. Streptomycin is still under test and its possibilities and dangers make some form of control in its use imperative. This has been covered by a form of liaison between the physicians at the General Hospital, the doctors of the city and the Import Department of Government. As much of the drug as can be imported through normal channels will be made available to the former, the latter being able to obtain it at cost price through the physicians who will keep records of all cases and make a report in due course.

B.C.G. is a live vaccine and demands the very strictest form of control in its manufacture and distribution. In the field it must be handled by experts who know what they are doing. Its possibilities are being explored both in the United Kingdom and elsewhere and it is proposed to examine this with a view to experimentation in this country in due course.

Both streptomycin and B.C.G. have limited possibilities at present. The latter can only be applied to those who show no signs of the disease. Its main use will lie in connection with selected vulnerable groups—children, nurses and so on.

(ix) PRISON HOSPITALS

There was only one prison, namely Outram Gaol on Pearl's Hill, in use until the middle of October when all long term sentence and European prisoners were transferred to Changi Gaol.

Outram Gaol: The common mild complaints, such as coryza and enteritis, remained at the same high level. Otherwise the general health of the prisoners and staff and the sanitation of the prison were satisfactory.

The nutritional value of the various diets for different nationalities is under the constant supervision of the Biochemical staff of the College of Medicine.

There were 8,647 vaccinations of prisoners; 114 banishees were both vaccinated and inoculated.

Admissions to the Prison Hospital during the year numbered 1,726—a daily average of 62.05. Of these 48 were referred to the General or other hospitals for further treatment.

Outpatient attendances reached a very high level some hundreds reporting on occasion. As it is certain that quite a percentage of these patients are malingerers, this figure cannot be taken as any indication of the day-to-day health of the prison.

The total number of cases of venereal infection was 181 as against 121 of the previous year.

Some 1,199 prisoners were accommodated in this gaol at the end of the year as compared with 1,751 in December, 1946.

Changi Gaol: This prison was taken over from the Military on 15th October, 1947. The hospital accommodation consists of examination room, dispensary, dental clinic, operation theatre, laboratory, two wards of 12 beds each, a ward of 4 beds, a ward of 8 beds for tuberculous patients, an observation ward and an isolation ward. During the short period under review total cases treated in hospital numbered 116; outpatients numbered 4,523.

The general health of the prison was satisfactory. Ten prison inspections were made during this period.

The highest incidence of disease amongst prisoners, especially new admissions, was skin conditions, particularly scabies, ulcers, dermal mycosis and impetigo. There was also a high incidence of anæmia of secondary origin. Injuries listed were in the main due to accidents, fights and falls and were of minor degree. One case of eosinophilic lung was diagnosed among those suspected of pulmonary tuberculosis.

By the end of the year over 900 prisoners were accommodated in this prison as compared with some 300 before the war.

(x) POLICE HOSPITAL

The average daily number of patients treated in the Police Hospital was 12.11, total admissions for the year numbering 830. There was an epidemic of mumps among the new recruits, these being dealt with at the hospital for infectious diseases. Sick parades recorded 11,921 attendances. The Force consisted of 2,834 N.C.O.'s and men at the end of the year.

At a clinic operated for the benefit of the families of members of this force, 17,715 total attendances were registered. The pre-war creche was reopened but since the majority of the rank and file are now Malays, who are particularly sentimental about separating from their children during the confinement of the mother, this hitherto excellent organisation closed through lack of support.

No less than thirty-four outlying stations were visited each month and a thousand visits to expectant mothers were recorded for the year. Some of the cases, Indian mothers in particular, went to Kandang Kerbau Hospital to be delivered, but the majority were delivered by a midwife.

(xi) GOVERNMENT MEDICAL STORE

Storage accommodation has proved one of the major difficulties during the year. One building was condemned and had to be evacuated immediately; another proved unsatisfactory in that storage shelves were rendered useless through action by white ants. The division is now accommodated in a non-government building on a rental basis and this is required for other purposes. The principle of an entirely new building contiguous to the General Hospital has now been approved and the first stage in its construction will be started in 1948. The Medical Stores is not merely a building for this purpose. A central manufacturing and pharmaceutical laboratory for the hospital services has to be maintained as well as a Pharmacy School. All equipment and drugs for a considerable medical organisation have to be purchased and checked through this section. A proper up-to-date institution for all these purposes is an urgent priority, particularly as no accommodation exists for dangerous chemicals. In addition to a shortage of trained clerical staff, a considerable amount of the time of both the Senior Pharmacist and the Pharmacist has been taken up in teaching duties at the College of Medicine. This department has suffered in consequence and very essential surveys were not completed at the end of the year. The posts of Pharmacist and Assistant Pharmacist were vacant throughout the year but fortunately a temporary officer, suitably qualified, was available.

During the early part of the year large stores arrived. These included most of the balance of the first period Young Working Party supplies, some second period supplies and a large shipment of milk from Australia. From then on supplies became difficult. There was considerable delay in arrival on Crown Agent orders—a period of one to two years' delay between dispatch of indent and arrival of goods. In consequence, advantage was taken of supplies offered by the British Stores Disposal Board, but in spite of this considerable local purchase had to be effected. The value of the stores purchased from the Disposals Board during the year was approximately $25,000.

Transhipment of stores on behalf of the Federation of Malaya continued throughout the year.

A survey of stores was commenced but has not been completed to date. Serious deterioration had occurred in stocks taken over from the Japanese and from the Military. For this reason surplus stores will have to be sold quickly.

Stricter supervision under the Poisons Ordinance Administration has been instituted and the indiscriminate sale of "sulpha" drugs, indecent advertising and the scale of patent medicines have all received serious consideration.

The dispensing services in all hospitals require modernising in order to provide efficient service for any proposed hospital schemes; and with this end in view inspections have been carried out.

PART VI

KING EDWARD VII COLLEGE OF MEDICINE

As a separate report is issued by the Principal of the College, only a brief review is recorded here. The College of Medicine with the Dental School is situated in Singapore and their Licences are recognised by the General Medical Council in the Medical and Dental Registers for registration purposes.

Work involving rehabilitation continued to be carried out in the College during the year under review. Government sanctioned a special vote of $76,800 for extensions to the Biochemical, Bacteriological and Physiological Departments thereby enabling double the number of students to be accommodated. The library was removed from the second floor to the ground floor where the Keith Museum once was, giving far more space for the housing of books and for study.

Final Professional examinations were held in June and December. In June two students were awarded the Licentiate in Medicine and Surgery and two the Licentiate in Dental Surgery. The standard in the Final Professional Examination held in December was extremely high, one student being awarded the Lim Boon Keng medal for obtaining distinction in Materia Medica and Pharmacology and Medicine, and two students the silver and bronze medal respectively. Eleven students graduated in Medicine and Surgery and one in Dental Surgery at this examination. A course in Pharmacy was started in June and was attended by 25 students.

Eighty three new students were admitted to the College at the beginning of the academic year in October, 58 as first year medical students, 2 as third year students, 2 as fourth year students, 1 as fifth year and 1 as sixth year students, also 18 first year dental and 1 third year dental students. This gives a total number of students in the College at the beginning of the academic year of 339, 254 being medical, 60 dental and 25 pharmacy; 219 students were resident in the hostels.

A Graduation Ceremony was held on 27th February, at which His Excellency the Governor-General, Mr. Malcolm MacDonald, spoke to the gathering and unveiled a portrait of Mr. Liew Weng Chee which was presented to the College by his son, Mr. Liew Kwong Hon, who donated a sum of $150,000 to perpetuate his father's name through the Liew Weng Chee Scholarship.

During March the Carr-Saunders Commission on Higher Education visited the College and met the staff and students.

The year is noteworthy in that the Licentiate in Dental Surgery, Singapore, was recognised by the General Medical Council in November.

Considerable difficulty was experienced as in 1946 in recruiting suitable staff and it was only towards the end of the year that equipment which had been ordered from England began to arrive.

The financial assistance system to old students continued. With regard to new students, the Government decided to limit this assistance in the case of Singapore to 6 students of whom 3 were medical and 3 dental, and in the case of the Federation of Malaya to a maximum of 16 (10 non-Malays and 6 Malays) of whom 10 were medical and 6 dental.

Research continued to be restricted owing to the limitation of staff and equipment. As in the previous year the Department of Biochemistry continued to carry out a number of valuable investigations and surveys on such matters as family dietaries, food consumption of medical students, feeding of pre-school children, and took part in a social survey by the Social Welfare Department.

In Bacteriology research work being undertaken included the following:—studies on antibiotics, local strains of the food poisoning group of bacteria and other organisms and a serological study on the blood reactions of the normal population of Singapore in relation to typhoid and typhus fevers. The Department of Biology is conducting an investigation into the possible aetiological significance of parasites in tropical eosinophilia and the Medical Unit is making investigations on eosinophilic lung, together with special histological studies of pleural effusions and of material from liver punctures.

PART VII

STAFF WELFARE SCHEMES

The welfare work on behalf of the hospital servants and their families is mainly undertaken by the Hospital Shops and Canteens, a simple self-supporting organisation which was started in 1946 to combat the "black market" operations then prevalent in Singapore, by acquiring meals at cost through the Social Welfare Department, provisions and clothing at wholesale rates from dealers, and other necessities of life which could only be obtained from "under the counter" by the "man in the street".

During the year 1947 this organisation met an urgent need but now as it is no longer the case of too much money chasing too few goods the law of supply and demand does not bear too heavily upon the shoulders of the small wage earner and this welfare work, although appreciated, is not such a necessity.

At the Civil General Hospital, where the hospital servants and their dependents number no less than 3,000, the work of this organisation is augmented by two small coffee shops which are run and managed by a Methodist minister who had to relinquish his religious duties on grounds of ill-health. These are found to serve a useful function by catering for the needs of the friends and visitors to the hospital, as well as the staff.

A welfare committee was also formed, each hospital appointing its own representative. In the early days meetings were held frequently and grievances, real and imaginary, were well-aired in a friendly manner. It was found, however, that the majority of the grievances were so trivial that it was mutually agreed to discuss only matters which could not be satisfactorily settled between the representatives and the heads of the hospitals.

The realisation amongst the hospital servants that the senior members of the staff are actively interested in their welfare has led to more harmonious working and a happier atmosphere all round. This has been noticed and remarked upon by members of the staff who have returned after a few months absence from the Colony.

From time to time representatives of the Singapore Medical Labour Union meet the Director and Chief Medical Officer for more formal discussion.

In October, 1946 a committee was formed for the purpose of dealing with the working and living conditions of the Government Health Department labourers. This Committee of eight included representatives of the various labour gangs, their selected member presiding, and the Senior Sanitary Inspector acting as liaison between the Committee and the Chief Health Officer. Matters such as working hours, conditions of work, transportation of labour and issue of rice ration and cases of genuine grievance were discussed and investigated.

After about six months, however, there was a falling off in attendances at these meetings and personnel made direct approach to the Chief Sanitary Inspector or Health Officer regarding their problems.

A Co-operative Society, managed by a Committee elected by the members, is being run most successfully. The Chief Health Officer is President and Treasurer. At the last general meeting there were 527 members out of a labour force of 725 and total funds to the credit of the Society were $15,504.16. The average subscription per member per annum was $48.91.

The time has come for a more advanced and adequate type of welfare service with trained welfare officers and Government is being approached through the Commissioner of Labour accordingly.

PART VIII

FINANCIAL STATEMENT

(*a*) REVENUE

Hospital Fees, etc.		Medical General and Health		Total	
$	c.	$	c.	$	c.
593,634	61	125,604	83	719,239	44

(*b*) ACTUAL EXPENDITURE

——	Medical General		Hospitals and Dispensaries		Health Branch		Social Hygiene Branch		General Clerical Service		Government Medical Store		Total	
	$	c.	$	c.	$	c.	$	c.	$	c.	$	c.	$	c.
Personal Emoluments ..	332,558	54	1,213,213	80	206,527	66	89,705	63	96,452	15	41,135	35	1,980,593	13
Other Charges	175,593	24	2,240,533	06	389,526	27	96,742	35	..		356,580	52	3,257,975	44
Special Expenditure ..	29,632	50	48,353	04	98,911	20	5,000	85	..		..		181,897	59
Total ..	537,784	28	3,502,099	90	694,965	13	191,448	83	96,452	15	397,715	87	5,420,466	16

Note.—Expenditure includes College of Medicines.

PART IX

No. 4 of 1948

COLONY OF SINGAPORE

From a paper laid before the Legislative Council by Command of His Excellency the Governor.

EXTRACTS FROM THE MEDICAL PLAN FOR SINGAPORE.

COMPRISING—

(*A*) The Medical Plan (Advisory Council Paper No. 12 of 1947).
(*B*) Modifications to the Medical Plan.
(*C*) Memorandum on "The Medical Plan and how it arose" by the Honourable Dr. W. J. VICKERS.

Annexure A.

THE FUTURE.

(Advisory Council Paper No. 12 of 1947.)

MEDICAL PLAN FOR SINGAPORE.

Now that the debates on the budget for 1947 have been heard the citizens of Singapore are sufficiently aware of their financial future for the purpose of this memorandum. The present would seem to be an appropriate moment to review the medical needs of the community in consequence; the moment to decide on a broad outline of the sort of medical and health service which is to be aimed at for the Colony of Singapore. The decision must be an important one because it affects the future well being of every man, woman and child in this Colony. It rests on a brutal cash basis: It must be taken now: 1947 must be the planning year.

Is the Colony to have a small organisation dealing only with the minimum of its acute disease, or is an adequate hospital service on European lines to be evolved?

No medical adviser could subscribe to the former conclusion. In the preventive field there is really no choice. Adequate control against epidemic outbreak from without and within cannot be avoided. A committee consisting of the Director of Public Works, the Principal, College of Medicine, the Surgeon, General Hospital, the Chief Medical Officer, the Government Architect, the Secretary, General Hospital with the Director of Medical Services has attempted to solve the medical problem in these pages. The Chief Health Officer, the Professor of Dental Surgery and the School Medical Officer have aided the Director of Medical Services in assessing the preventive aspects of the question.

What is the position which faces us today? After four years of enemy ccupation and one year of struggle in keeping a small medical service on its eet, it may be summarised as follows:—

Hospitalisation.	*Approximate Bed Strength.* *Now.*	 *Before.*
eneral Hospital	550	700 + V.D.
andang Kerbau	200	200
an Tock Seng	200 (+ 200 T.B.)	600
t. Andrews	Base Medical Stores	60
t. Andrews Orthopædic	60	60
pproximate total general beds:	*1000*	*1600*
rison Hospital	50	50
.D. Hospital	70 3rd class	Included in General.
nfectious Diseases Hospital	250	250
eper Hospital	300	200
.B.	200 in T.T.S.	?

Thus excluding, and rightly, mental disease and leprosy, two conditions hich have always been treated in separate institutions, the total bed strength oday is only some 400 less than the pre-war and this with a reduction in medical aff in all directions, a result which would have been considered a practical npossibility in normal times, a staff which has been seriously over-worked for any months. Yet the amount of work which has been covered by this riously depleted organisation is approaching the pre-war. As many cases have one through our wards and clinics during the last few months as in any pre-ar year. The significance of this statement cannot be over-stressed, and the ublic should note it in connection with the difficulties which had to be faced. ack of doctors, lack of nurses, lack of other personnel, shortages in equipment; ese are some of the factors which must be borne in mind in assessing the markable effort which has been made by the medical staff in maintaining a rvice which has guaranteed that no acute disease which demanded our tention should be turned away from our hospitals however crowded the wards ailable, however tired the staff.

On the opening up of the hospital system during the months since the -occupation the opportunity has been taken to re-organise and re-equip on a ore modern system than the pre-war. Although the public cannot fail to alise by the time it has absorbed this brief review the unsatisfactory hospitali-tion it must face over the next few years, it must be made aware of the fact at the re-organisation of Singapore Hospitals was discussed for years before e enemy occupation, and that plans were in mind in 1941 for considerable nprovement. Sir RICHARD NEEDHAM, during his visit to the College of edicine on behalf of the General Medical Council in England, severely iticised the existing organisation in 1934 and again in 1939, particularly the ck of any proper out-patient system and the absence of "units". A govern-ental committee laid down an interim plan for the General Hospital which as under action when the war broke out here and planning for an extended aternity hospital was also being done.

Thus it will be clear than an expensive and far-reaching hospital re-organisation was found to be necessary before the occupation; a complete overhaul i imperative now if even minimum needs are to be met. This is the ideal opportunity before large sums of money are wasted in attempting improvement which will satisfy no one. Without the scheme envisaged, inefficiency wil grow with rapidity, and not only will the service given at present fall back wit growing public clamour but the high standards which the public has a righ to expect will become an impossibility.

A word about the "unit" system which is being adopted, and a concentration of general acute disease at the General Hospital with women's diseases an midwifery at Kandang Kerbau. Prior to the war both the House Surgeon an the Specialist found themselves searching for their patients in many wards. A a walk round these can cover some 4 miles or more in the General Hospital alon it must be clear that a large proportion of the patients failed to find the attentio they expected. Each Specialist and his staff must have the patients in a grou of contiguous wards, whether these are First, Second or Third class. He mus in fact have his own unit to his hand. This is the modern European practic It is certainly the only satisfactory one from any point of view. A concentratio of acute disease in the only two reasonably satisfactory medical buildings in th city is really the start of the plan to use existing buildings to the limit of the capacity. It is thought by some that a return to the pre-war procedure mean better accommodation for first class patients, particularly women. This is fallacy. It will take many months to produce the staff and accommodatio required to give first class patients the attention they expect. In any case ou scheme will produce conditions at least comparable to those of 1941 by 1948.

Tan Tock Seng Hospital will have to take its proper place in the gener hospital system, and take the over-flow of the poor patients from the Gener Hospital. The Singapore hospital system seems to have almost eliminated th poor during the Japanese occupation. The service seems to have become or primarily for the lower middle class. Whatever the pre-war practice this is sti the position unfortunately. We have thus to accustom ourselves to dealin with the very poor on a proper scale. This means propaganda, and befo propaganda, the necessary beds. As it is the medical staff is inundated wit those who can pay something however small, and we cannot deal adequate with these. We are convinced that there is a really poor class in this ci which has not been adequately tapped by our social services as yet, except the field of venereal, of mental and infectious disease, and perhaps in infa welfare work. Such a section must be our future primary aim.

Nothing can really be done for chronic disease in this city today. All can do is to try and treat what acute disease reaches us before it is too lat but even this has to be turned adrift at the first possible moment for the ne case, third class patients to Tan Tock Seng up to a limit of 200 beds, and fi and second class patients to their homes to convalesce. Such conditions as T. are not in the category of acute disease. Yet an attempt to deal with so 200 such patients is what we are making and have made since the re-occupatio That these cannot be adequately treated should cause no surprise; this emoti should be reserved for the fact that even an attempt is made in this directi when every bed is required to keep the main stream of desperately si at a really proper level. Rest and good food is given and as much medical ca as circumstances permit, and this is all that can be expected for a long ti to come in such cases. It is doubtful if even these cases of T.B. should accepted under the conditions which exist in Singapore today.

The Leper Hospital has received more patients since the liberation than at ny previous time in its history. Thus accommodation provided for some 200 re-war cases has had to cope with nearly double that number. This congestion as been relieved by the transfer of some of the patients to Sungei Buloh. A olicy as to future practice is under investigation.

Accommodation for some 500 people now exists in the Mental Hospital, but urther progress will be slow owing to the very serious damage done during he Japanese occupation. Mental cases cannot be placed in adequately protected vards and that is the present situation. That many more than the present umbers will have to be accommodated as soon as possible is only too clear to hose who are acquainted with the problem. Progress here is entirely a matter f labour, and the material available.

ispensaries and Clinics.

Apart from one general urban dispensary and a travelling rural one under he control of dressers, only two crowded and very unsatisfactory general ospital out-patients departments are in touch with the adult population at the noment. In fact the existing out-patients service can be said to be totally nadequate in every way however strenuously the depleted medical and nursing taffs working in these sections strive. Municipal clinics only deal with children p to two years of age, while rural clinics can do little more. A School Iedical Service is functioning with one clinic and a totally inadequate staff. hus while the majority of the people cannot get minor medical attention at ll, nothing has ever been done for the pre-school child, the child between 2 and years of age. While concentration had to be made on all classes of the com-unity during the British Military Administration period because of their eriously depressed and malnourished state, all the clinics then in use have now een turned back to their pre-war and proper use, *i.e.* to the assistance of the oungest and most susceptible section of the population. Only in the infant velfare field can attention be said to be reasonably adequate. But concentra-ion on this age group with total neglect thereafter seems to be a shocking waste f effort. That many an unfortunate, both adult and child, who might bring is disease in a curable stage to a proper out-patient system, is barred from health nd even life by prevailing conditions is all too clear to me.

The very acute shortage of beds in the early stages of the re-organisation ampaign during the British Military Period necessitated the use of a separate nstitution for the treatment of venereal disease. This institution is within easy each of the class most needing such attention, and it has proved to be such a uccess that all the experts concerned have recommended continuation of the olicy thus initiated. The only trouble is unsuitability of the present building, e limitation in the number of beds available and the shortage of suitably train-d staff. Only one V.D. clinic in the dock area is available apart from this ospital; first and second class patients are treated in the General Hospital.

ealth Campaign.

The Government Service is responsible for health control over the Island of ingapore outside Municipal Limits, and for total Port and Air control. Prior the war this service had maintained a remarkable efficiency, and an essential e, in view of the paramount importance of this area in the field of world com-unications. After the liberation this happy state of affairs was found to exist longer. All the carefully built up sanitary and anti-malarial control had so eteriorated that very extensive temporary measures had to be instituted to pre-nt a disease outbreak. Shortages in staff and materials have prevented anything in the nature of a proper re-birth however. This colony has been very luck in that epidemics spread has been limited to small-pox and infantile paralysis We are surrounded by territories less fortunate, and unless present measures ar steadily enlarged and reinforced, a guarantee against further and more devastating sickness cannot be made. Such a result would have deplorable effects o local prosperity apart from the appalling costs a failure in our preventive measure would entail.

Government dental services are non-existent for the general public-child an adult. A teaching unit as a part of the College of Medicine is all that is possibl today.

The Necessity for Further Measures.

Based on European and Dominion standards an approximate of 4,000 genera hospital beds, excluding all special disease, is a low minimum requirement fo such an area as Singapore. It means more than double the existing accommodation however, but this is the figure which must be aimed at. It is one whic should be sufficient to deal with all our acute disease. Even then we shall nee extra hospitals to meet such activities as venereal disease, maternity cases on th present approach, T.B. and so on. I am taking it for granted that mental diseas and leprosy will continue to be outside the scope of the ordinary hospital. W cannot possibly do with a smaller general hospital bed strength than this. Th peoples of Singapore must face up to realities if they want their sick to be treate adequately. They must be prepared to pay for the minimum satisfactory service All the drugs and equipment will soon be at hand. The thing to do now is t provide accommodation and staff. Both can and will be available if the prope approach is made. I have talked to local medical and nursing and midwifer graduates and these are not prepared to stay and work for the public unless th latter is prepared to give them what they think is a just and reasonable due.

Not half the hospital beds required are available today. The present sta is barely capable of dealing with 1,000 general beds if a total collapse is to b prevented sooner or later. The accident rate is some five times the pre-war clamouring crowds besiege the Out-patients Department: no patient can receiv proper post-acute treatment: only a fringe of the very poor has been touched

Such statistics as are available would appear to indicate a better genera health in Singapore than the pre-war. Nothing could be further from the trut in my considered opinion. While figures clearly show that many of the les robust died during the occupation period we have not felt as yet the true after effects of the military struggle. Such observation as has been possible points t coming generations of very poor physique, generations far less able to stand th vigours of a normal life, a C.3 population. Unless we are very careful man more hospital beds and clinics than I indicate will be required in the not to distant future. People complain with justice that they cannot waste the tim required. More up-to-date out-patients departments, more hospital clinics, mor and yet more beds are an urgent necessity. A great deal more must be done t give those in distress the service they need, and are not yet able to demand.

The Anti-malarial scheme must be brought up to its pre-war level. Whethe the new drugs such as D.D.T. and paludrine will be able to replace the olde methods are matters requiring the most expert knowledge and attention. N one can pass a definite opinion at this stage. Whatever happens this Colon must be made free of such an obvious danger as malaria if it is to expand an even to exist satisfactorily. Similarly our sea and air ports must be acceptabl to international commerce. This provision demands certain minimum requirements which are now the subject of anxious thought.

And finally medical teaching must be an integral part of the Medical Services if Singapore is to be the site for the new University. Standards in this connection will be those of the United Kingdom in equipment, accommodation and personnel.

Training of Personnel.

Today the Civil General Hospital and Kandang Kerbau Women's Hospital, with the associated College of Medicine, have a nucleus of well qualified specialists. These and other medical institutions which must arise in a few short years will require a sufficient staff to meet all demands. Provided the proper outlook is adopted now, one covering proper pay and accommodation, this country will be able to supply most of the medical staff it needs in due time. We must create either a sufficient medical centre here or elsewhere capable of meeting modern demands, or suffer the consequences. One of these will mean staffing from abroad. Trained medical and nursing staff takes a long time to evolve, and the public expects, and rightly, that such training shall be of the highest quality. The necessary nucleus is here. All we have to do is to build around it adequately.

Method of Advance.

So in Singapore the development of the proposed policy merely means an extension of an already existing base on an adequate modern structure; the provision of suitably equipped buildings, both old and new; suitable and sufficient staff to deal with these, a teaching institution both medical and nursing capable of the new demands. An advance to such a goal can only be obtained over a number of years. The staff problem alone makes this a necessity. None the less real urgency exists. Full planning is required now, and a definite programme should be laid down and completed by the beginning of 1948. A five years scheme should be initiated on the following lines on the basis of an annual capital expenditure of some 10 million dollars.

SPECIAL CAPITAL EXPENDITURE :—

Two years 1948–1949.

Buildings.	*Approximate cost.* $
Expansion and modernisation of the present General Hospital to 1,000 beds	10,300,000
Expansion and modernisation of Kandang Kerbau Hospital to 500 beds	6,750,000
Base Medical Stores	242,000
V.D. Hospital of 200 beds	4,574,000
Organisation of school, medical and dental services to meet the new educational demands—First stage ...	100,000
Expansion and modernisation of Tan Tock Seng Hospital to 800 beds	1,400,000
Rural clinics : seven centres	214,000
Rural Cooly lines and Overseers quarters—First stage ...	800,000
Sea and air port and health reorganisation schemes—First stage	370,000
Anti-malarial work and rural village drainage scheme—First stage	250,000
	25,000,000

Three years 1950–1952.

Buildings.	*Approximate cost.*
	$
Second General Hospital of 1,000 beds	21,500,000
Mental Hospital improvements	1,254,000
Expansion and improvements to Leper Hospitals—300 beds	780,000
Expansion of school, medical and dental services to meet educational demands—Second stage	100,000
Rural clinics and dispensaries: nine and three respectively	348,000
Final sea and air port and health reorganisation schemes—Second stage	270,000
St. John's Island water supply scheme	250,000
Anti-malarial work and rural village drainage scheme—Second stage	380,000
Rural Cooly lines and Overseers quarters—Second stage	1,200,000
	26,082,000

Additional Items for Special Consideration.

Additional major infectious diseases centre of 50 beds ...	852,000
Expansion and improvement of Orthopædic hospital from 60 to 120 beds	1,067,000
T.B. hospital of 300 beds	5,817,000
	7,736,000

Summary of annually recurrent expenditure for the five-year period.
Average of 10 million dollars.

Summary of special capital expenditure annually for the five-year period.
Average of 10 million dollars.

Total expenditure average for the period 1948–1952.
20 million dollars per year.

Notes on the Above.

1. A hospital system capable of dealing with a population of some 200,000 people cannot deal with three of four times that number. Neither can it deal with an up-to-date medical school. That is a fundamental fact which has to be faced today. The existing accommodation is totally inadequate and out of step with modern demands.

2. The sums given in the above summary can only be very approximate. It is thought that $8,400 a bed might meet the case on present costs excluding staff accommodation. When present United Kingdom figures are taken into consideration the figure is not excessive. Housing of the staff is the burning question. All but the senior staff must be placed on the premises. One of the greatest difficulties in expansion today revolves around this question of accommodation. Staff cannot be obtained if there is nowhere to house them. And beds cannot be created without the staff to run them. From now on the fact has to be faced that all medical departmental staff, whatever the race or creed, must be *reasonably* housed according to occupational status. Today we cannot expect further medical personnel because we have nowhere to put them. The intake of nurses and sisters is strictly limited by this same factor. Appendix *A* gives an indication of costs

in this direction if staff is to be housed on pre-war lines for the new 1,000- bedded hospital proposed. The cost is doubled thereby. Is the pre-war standard of housing to be reduced?

3. The approximate staff required for a teaching hospital of a thousand beds and for a hospital for maternity and women's disease is appended for information—Appendices *B* and *C*. Adequate staff will be demanded by London University or any institution which is to be connected with the new University College. This must be clearly realised if Singapore is to be the chosen site. The impression remains that the staff indicated is not excessive but rather the reverse. The staffing of the other medical institutions which are required in Singapore has been worked out in proportion to their relation to teaching and the type of disease to be catered for.

4. The cost of sites has not been included. This may be an expensive item but certain government property has been earmarked already. The new General Hospital will have to be sited on the opposite side of the town, more or less, to the existing General Hospital, and its siting may have an important bearing on the new University if it is decided to place this on Singapore Island.

5. The proposals put forward in this memorandum cover two general hospitals and although this scheme can be taken as the basis for argument, further consideration may suggest a building up of the existing General to one large and extensive hospital centre of some 1,800 general beds, with a small accident hospital of some 200 beds elsewhere in the town. At least five million dollars will be saved by this expedient.

6. The position of Tan Tock Seng Hospital will have to be carefully reviewed. This institution can be extended and modernised into a good secondary type of hospital and infirmary, and it should continue to be used for the overflow from the third class wards of the main general hospitals—its present chief function. It must continue to play an important part in the Hospital Scheme for Singapore, and must take its proper place in that scheme.

7. The treatment of women—and this includes maternity of course—has given rise to much anxious thought and consideration. Our aim must be to reach the very poor who cannot pay and so tend to be out of reach of our hospital system until it is too late and the final tragedy is enacted. But the better class, the paying patient, is not being forgotten. For the time being there is neither the staff nor the accommodation to meet the excessive—excessive by pre-war standards—demands now made on the Government organisation. This will be remedied in due course if the plans we are envisaging come into being.

8. Venereal disease needs special consideration in view of the aftermath of the war and the advances which have been made in the treatment of the disease. A special hospital with treatment and follow-up concentrated in the most suitable areas of the town has led to unexpected and remarkable success in the present campaign. Better-class patients will, of course, continue to receive attention in the paying wards of the General Hospital. That confidence between patient and doctor which is an essential in such a condition will continue to be the key-note of work in this direction. There will be no coercive compulsion as far as the Civil Authority is concerned. An excellent beginning has been made in our new approach to this disease under very difficult and exacting conditions. The present building—an old Japanese hospital—is quite unsuitable in its present form as a medical institution. With proper up-to-date facilities I anticipate a most satisfactory expansion in the control of this most important of social evils.

9. The future of the present Orthopædic Hospital is a question which merits consideration. This institution is a part of the present St. Andrews Mission. At the moment it is run by Government and is serving an essential

purpose in the treatment of infantile paralysis, nonpulmonary tuberculosis, and similar conditions in children in the existing hospital scheme. It should be expanded to at least double its present accommodation and work as an integral part of the hospital services under specialist supervision.

10. The Base Medical Stores is housed in the old St. Andrews Mission hospital in the town. A hospital service such as that envisaged here demands a properly controlled and centralised stores system as an essential, and until one is established this building cannot be evacuated. It is in any case hardly suitable for a hospital. Such a small institution within a stone's throw of a large general hospital means a serious waste of nursing staff and other personnel. Its continuance on pre-war lines cannot be recommended if the medical benefit of the public is the first consideration.

11. The existing Infectious Diseases Hospital is a Municipal concern, operated by both Government and Municipality at the moment. After consultation with the Municipal Health Officer the suggestion is made of an expansion in this direction by the opening of a 50-bedded institution for major infectious disease outside Municipal Limits, the present organisation being used for minor disease of this type.

Infectious disease control is so intensely bound up with the general preventive services, and so with the Quarantine Station at St. John's Island, that essential expansion must be approached from the broadest angle of thought. St. John's Island is only suitable for third class patients in a modern build-up.

The quarantine station requires additional expenditure on it in any case. A more modern water-supply system was under consideration prior to the war, and it is most desirable that the question of the provision of a good local supply should be re-opened forthwith. This quarantine station is Singapore's main line of defence against imported disease, and it, and its connected services, must be maintained on the highest priority basis. Thus the pre-war launch and passenger services must be re-established without delay. Two modern launches and two passenger flats will have to be purchased. At the moment water is transported to the island at regular intervals and two small R.A.S.C. launches only are at hand. During recent months between 1,000 and 2,000 inmates has been a frequent occurrence, and the use of the island is likely to increase as time goes on.

Port and Air Quarantine, and thus the control of Infectious Disease must always be a priority matter in Singapore. Any real breakdown in this service would mean many times any expenditure the health authority is likely to demand. The danger point has been within reach on more than one occasion over the past months, and shortage of staff and adequate quarantine accommodation is a matter of very serious consequence at the moment. Not only is medical and inspectorial staff less than half that required, but lack of essential buildings at our air centres means that the necessary international obligations cannot be enforced properly. The R.A.F. is doing what it can to help but it must be realised that this is a Civil responsibility which has to be met if Singapore is to remain on the communications map of the world. That we must take our proper place in this setup is clear to both commercial and Government interests alike.

12. The vexed question of T.B. has been to the fore since the elimination of the Japanese but the public must realise that this disease has to take its proper place in the medical scheme. Until we can deal adequately with our acute disease it would be a tragic mistake to concentrate our energies on such a vast problem as this. When the funds have been provided for our *essential* medical services then we can afford to expand in other directions such as Tuberculosis. This is not to say that T.B. is not of the utmost importance to

the public health, but unless we are prepared to remove sufferers entirely from our slums and organise a vast re-settlement scheme on proper lines, we must move step by step. Housing and malnutrition are just as important items in this connection as medical treatment. Observation would appear to indicate that there was a considerable increase in T.B. over the enemy occupation period which still persists. This is a pointer to the grave under-nourishment which has occurred and which still continues even if in a less obvious form.

The formation of a non-government Anti-Tuberculosis Society is under consideration by some of our citizens. It will conduct surveys and establish one or two up-to-date clinics in this city under expert direction, and this would appear to be the immediate answer to the problem. The sanatorium idea can then be developed later on when we are in better position to do so.

13. **Rural health and school medical and dental services:** Thus far it has been mainly the curative side of our services to the public which has been dealt with as deficiencies in this respect are so obvious and so closely allied to current criticism. Preventive medicine must take its full and proper place in any medical scheme however, as the old adage that prevention is better than cure was never nearer the mark than it is today when our coming generations are in such a depressed state of health. Any competent observer can soon satisfy himself on this point. Thus the need for first class school medical and dental services and a full-scale pre-school clinic scheme.

Infant Welfare Services dealing with children up to two years of age are covered by the Municipal Commission within City Limits. While a similar service was steadily developing before the war in Rural Singapore, and much good work had been done in the schools, the Government organisation had no satisfactory accommodation. The time has come when we must do a good deal more in this direction if future hospitalisation is to be kept within the minimum limits indicated above. After some 20 years of rural maternity and child welfare work not one really up-to-date centre is in existence. Some function in old shop-houses, while one is held in a cooly line and another in a police pound. It is only the enthusiasm of the Public Health Staff and the co-operation of the public which has enabled the existing service to carry on. Sixteen centres are proposed over the next five years apart from one or two which local Chinese communities are proposing to build for themselves.

And nothing has ever been done for the pre-school child in town or country until the feeding scheme approved a short time ago started to function. These children will be dealt with in the special hospital and rural clinics envisaged, and in special units in the hospitals, as soon as sufficient staff and accommodation are available. This is a vital and essential field which must be covered at the first possible moment.

While pre-war there were seven Health Officers—three women and four men—to carry out examinations and treatment of school children, only two lady doctors are available today for this work for which no accommodation exists. As it is estimated by the Educational Authority that up to 100,000 children will have to be dealt with regularly in the school scheme in the not too distant future the existing state of affairs from the medical side can only be described as deplorable. Sufficient staff and clinics to deal with this problem cannot be long delayed without very serious results for the coming generations.

No school dental service exists at all. It is estimated that at least 75% of our children suffer from dental caries. The sooner this service is started the better for all.

Re-organisation in the Rural Dispensary Service has already started by the provision of Travelling Dispensaries in the 1947 Estimates, and the gift of one by the Rotary Club of Singapore. Two static dispensaries exist at Bukit Timah and Paya Lebar. Three more are essential in the more outlying and densely populated areas.

With the money voted for 1947 it is hoped to complete the repair to most of the permanent anti-malarial drainage system necessitated by the damage caused during the Japanese occupation. It will then be necessary to continue a considerable programme of new construction for the more densely populated rural areas where large sums are being spent at the moment in carrying out open ditching and oiling. This work is bound up with sullage drainage in the villages where no means exist at present for the removal of large amounts of water. Village populations seem to have spread over the Island during the last few years, and this fact in conjunction with the influx of Service personnel in new districts means a considerable increase in the pre-war anti-malarial control. The estimates given however only cover anticipated Civil expenditure in this connection. The Services are prepared to fully co-operate and the Singapore Public Health Conference is at work already on these lines. While malaria has been kept under reasonable control since the re-occupation by widespread and energetic but extensive temporary measures, a serious epidemic of this disease is always round the corner. So no relaxation in operations and expenditure is possible until the permanent scheme has been completed.

14. **Annual Recurrent Expenditure:** The annual recurrent expenditure for the Singapore Government Medical Department for 1947 reaches a total of some seven million dollars to cover a service approximating in staff and scope of the 1941 level as compared to an expenditure of some three million dollars during that period. This increase is due in the main to increased cost of food, drugs, equipment and other materials.

It is clear from a perusal of the foregoing that the increased services envisaged will mean a very considerable development in staff of all kinds and in particular in medical and nursing personnel: in drugs and equipment. A considerable rise in salary scales in general must be accepted over present rates if we are to continue any sort of service. On the other hand actual costs of food and drugs and equipment are bound to decrease considerably over the period.

A careful analysis of all the facts concerned has led me to think that an *average* of some 10 million dollars per annum over the five-year period under review should suffice to cover annual recurrent expenditure.

15. And finally a note in connection with the population to be catered for. It has been stated that one-fifth of Singapore's population is in the nature of a floating surplus and thus that there is no need for this Colony to bear medical costs in this connection. Such a view cannot be accepted by any responsible Medical Authority. Not only has careful research suggested that any estimate of the percentage of the non-stable section of the population is impossible on the statistics available, but whatever figure is accepted, common humanity and expediency demand that the poor man must be dealt with medically whether he is within our gates 10 weeks or 10 years. There will always be a steady but very minor flow of the well-to-do to a large medical centre such as this. The policy should not be to refuse these but to make them pay for the privilege.

W. J. VICKERS,
Director of Medical Services,
Singapore.

SINGAPORE, 11*th February,* 1947.

Annexure B.

MODIFICATIONS TO THE MEDICAL PLAN.

The debates on Income Tax and other budgetary matters have delayed a start on the Medical Plan outlined in my 1946 Annual Report and the Memorandum laid on the table of the Advisory Council in February, 1947. Thus the planning envisaged for 1947 has been moved into 1948. We can congratulate ourselves however on the fact that a start, even though a small one, is anticipated this year, and these pages will clarify what is proposed. While this further report must be read and studied in close association with that noted above, nevertheless in the light of the capital expenditure which can be expected over the next decade the plan has been carefully reviewed. The original envisaged a five-year period with an annual capital expenditure of ten to twelve million dollars according to the scope of the plan as a basis for argument. As it is now clear that nothing like this speed of advance will be possible either from the point of view of the funds which will be available to the Medical Department or from the amount of work that the Public Works will be able to undertake annually, the plan has been modified to both a 10-year and a 15-year policy on Your Excellency's instructions.

2. A Committee consisting of the Principal of the College of Medicine, the Chief Health Officer, the Chief Medical Officer, the Professor of Surgery, the Professor of Midwifery, Dr. Haridas and Dr. Nicholas has advised the Director of Public Works and myself in this review.

3. The Committee is of the unanimous opinion that a 10-year period should be the maximum in which these proposals should be completed. Singapore is so far behind the modern medical concept in so many ways that undue delay in reaching a very reasonable target outlined means more improvisation and thus more eventual expenditure.

4. The Committee has considered the plea that this Colony cannot afford a capital expenditure of 50 million Straits Dollars on its medical services in the coming years. It cannot accept this contention from whatever source it may come. Neither can it support the view that an undue proportion is ear-marked for hospitalisation. While prior to the war the Health Service—the preventive side—undoubtedly reached a degree of perfection with certain glaring omissions such as the school dental service and neglect of the pre-school child, the same cannot be said of hospitalisation or cure. Far reaching plans were under consideration and were about to be implemented in this direction in 1941. A further eight years since then has left our hospitalisation so much in arrears that to bring this back to the pre-war level—a point which has almost been reached in many respects and surpassed in others—is not enough.

HOSPITALISATION IN APPROXIMATE BED STRENGTH.

	Pre-War Potential	*Potential now.*	*As laid down in the Plan for Northern Ireland in 1946. For Singapore population.*
General Medical and Surgical beds	978	576	2,450
Ophthalmic and E.N.T. beds	130	93	390
Maternity	212	220	750
Orthopædic	114	67	180
T.B.	132	387	1,200
Children	100	49	630
Convalescent	56	106	480
Chronic	120	85	2,400
Ante-natal	10	21	370
Infectious Disease ...	250	250	750
	2,102	1,854	9,600

The above summary excludes venereal disease, leprosy and mental disease. Venereal disease and leprosy are receiving more attention than before the war while the Mental Hospital can receive up to the pre-war number of patients (1,800) as soon as sufficient skilled staff can be recruited and an increase from the present 700 becomes sufficiently urgent. Apart from these conditions the number of beds available is within 250 of the pre-war level. A further 300 beds could be provided if the Nursing staff was at sufficient strength. Over 1,500 beds are manned at present by 67 trained nurses and 171 in training: by 114 Hospital Assistants and 36 in training.

5. Staffing, and primarily nursing staffing, is the immediate obstacle to any further advance in hospitalisation. When more nurses are available then more beds can be provided and more doctors will be called for. The Japanese occupation with the lack of sufficiently educated girls at the end of that period is probably more important than the economic condition which prevails in the creation of the present situation. The Committee is certain however that the report of the Salaries Commission with the modifications proposed by the Director of Medical Services in the latter connection *together with proper accommodation* will help to solve the recruiting difficulty. The problem however raises the question of planning in an acute stage and is an important part of the answer to the question as to whether planning is necessary. Until more staff accommodation has been provided further recruitment and expansion is out of the question. The Committee wishes to bring this fact forcibly to the attention of Government: proper and up-to-date quarters for existing staff is a first priority, and must take priority over further hospital expansion. That this was realised as far back as 1941 is shewn by the plans then drawn up but never implemented because of the

war. Attention has been drawn to the expense of accommodation. Further Committees will no doubt examine the plans submitted but these must comply with modern requirements. It is no question of European or Asiatic but of suitable quarters for the post concerned. I have no desire to ask for undue expense in this direction but the Committee is adamant in insisting that quarters must be really suitable or no staff will be forthcoming.

6. The Committee has reviewed the hospital planning indicated in the 1946 Plan. Not only is it convinced of the paramount importance of proper and detailed planning at this stage but it feels that so important is rapid expansion that it advises the Government to concentrate on bringing the present General Hospital to a 1,500-bed strength as priority No. 1 in the Colony expenditure, to overcome the delay involved in the original scheme. The Committee wishes to emphasise that while staff accommodation must be a priority, a proper Out-patient Department and clinics, an up-to-date Children's Block, and a satisfactory Pathological Block are equally urgent. None of these can be provided without a proper overall plan for the hospital centre This plan should be worked out at once and proceeded with on the 10-year programme detailed. The 1940 plan for Nurses and Sisters' quarters should be modernised and proceeded with as soon as possible in the meantime. A decision in regard to the new terms for the nursing staff should be reached forthwith so that recruitment can be proceeded with at a steadily increased tempo while the rest of the programme is dealt with.

7. The Committee would refer here to the staff laid down for the 1,000-bedded hospital in the previous report. It has examined this critically in the light of the criticisms raised and has cut it to the following strictly *minimum* standard :—

Beds	1,050 (1946 report)	1,500 proposed
Senior Specialist	9	9
Anæsthetics	1	3
Junior Specialists and Registrars	26	32
H.S. or H.P.	32	32
Sisters	45	54
Staff Nurses	41	44
Trained Nurses	82	93
Prob. Nurses	324	364
Hospital Servants	240	360

The arguments revolve round the size of the nursing staff. Recent reports from the United Kingdom lay down a figure over the thousand mark for a 1,500-bedded hospital. A total of half this figure is suggested as a *minimum working* basis here as hospital servants take a more prominent place in this country than in the U.K. Our overall staffing figures are harshly practical and *may* have to be increased. They can be taken as a practical planning basis however. They certainly abolish the suggestions which have been made with regard to the previous report that the word "teaching" in a hospital connotes luxury. While our hospitals must continue to serve in the teaching field for a long time to come wherever the new University is sited, the new estimates concentrate on the public need, and what is essential for this purpose. Administrative and Special Department hospital staffs have been sufficiently indicated already. These must be somewhat expanded on the basis shewn in the 1946 report although most of the changes will be of a minor nature.

8. The Committee took especial note of the criticism in regard to the poor and distinction between classes, and strongly deprecates the veiled implications in this direction. The accommodation provided in the third class wards of the General Hospital today is equal to that in the United Kingdom and elsewhere and has been very favourably commented on by visitors from overseas with a knowledge of the subject. In the opinion of the Committee it is of outstanding quality. The majority of these patients are free but a nominal charge up to one dollar per head per day is made from any who wish to pay. Some twelve months ago I asked the Hospitals Board to consider the question of meeting all charges of third class wards but unanimity has not been reached on this point as yet. It is the custom of hospitals in all civilised countries to provide *paying wards* where patients who can afford it can seek privacy *or where special cases can be confined.* The charges vary in proportion to the number of beds per room, from one and up. This custom is particularly desirable in a country where several races live together with differing habits: but patients must pay for any such privilege unless other considerations such as doubtful diagnosis warrant a concession. The raising of the present charges to a much higher level has been under the consideration of the Hospitals Board for quite a time but no action has been recommended as it was considered that the present accommodation was too inferior. Second class accommodation is provided in part to meet the case of certain junior Government officials and other members of the community of similar status who desire it. Such a concession is in fact a part of the emoluments of the former. At the time of writing the beds at the General Hospital are in the (class) proportion of 39 to 97 to 564. The Committee recommends to Government the continuation of 1st, 2nd and 3rd class wards with a proper charge for the former after really suitable "privacy" accommodation has been provided in the proportion of 80 to 200 to 1,220 in a 1,500-bedded hospital.

9. In this connection attention is directed to the necessity for an Almoners Department, and to the recent expansion in Physiotherapy and in Out-Patients. An Almoners Department is now looked upon as an integral part of any hospital: it investigates the economic standing of the patients who enter it and "follows up" the cases needing its assistance after they leave. The Physiotherapy Department has saved endless "bed-hours": patients who previously had to remain in hospital can now be discharged much earlier and continue their treatment outside: many who had to remain cripples can now be made useful men and women again. This has relieved pressure on our bed strength which under the most auspicious of present conditions is desperately short of what is required for almost a million people, a fact which has been borne out by the statement that more patients are passing through the hospital services than ever before. The shortage of beds has thrown an ever increasing strain on the primitive existing Out-Patients Departments. That at the General Hospital for instance dealt with 114,167 attendances in 1947 as compared with 68,569 in 1946 and 33,662 in 1940.

10. While emphasising the various notes in the 1946 Summary the Committee wish to draw particular attention to the Base Medical Stores, to Tuberculosis, to Venereal Disease, to Leprosy and to Orthopædics. It records with satisfaction that a start has been made on the provision of the Base Medical Stores which must also be a Pharmacy school and a hospital manufactory. For instance certain essentials such as injection material, tablets, ointments could be prepared locally for the hospital services at 1/10th of the costs of importation.

This project should be completed as soon as possible as a part of the Hospital Plan and is so shewn in the final summary. Tuberculosis has drawn a lot of public attention to itself over the past twelve months although statistics would appear to indicate a situation at least comparable to the pre-war in the general population. While it must be reiterated that acute disease cannot be subordinated to chronic and that in consequence all our present bed strength should be reserved to the former, it will be seen that almost one third of our general beds are devoted to the more chronic forms of this condition. Tan Tock Seng Hospital has been made a centre for this disease : with the active co-operation of the Rotary Club a properly equipped clinic will be added to this institution during the present year. While the Committee is of the opinion that further advance in this direction should await a proper planning of the General Hospital, and be a part of such planning, it is prepared to bow to really expert opinion from elsewhere in this connection. In its opinion Tan Tock Seng Hospital eventually should be given over entirely to this disease when a sufficient bed strength has been built up. It would stress the necessity for retaining the St. Andrew's Orthopædic Hospital in this connection and the need for an expansion of this institution. Either this or a new institution must be evolved by Government.

11. Criticism has been levelled at the present situation of the Venereal Disease Hospital and clinic in the centre of the city and apart from other medical institutions. The Committee would merely point out that this solution was the one suggested by an expert with many years experience in the treatment of this disease in the East, *and its outstanding success.* That the present building is far from suitable can hardly damn the scheme : surely it is a credit in the right direction.

12. Leprosy is a condition which is receiving anxious present attention in view of the serious increase in cases which appear to have followed the Japanese occupation, and the influence of new and more hopeful drugs. Taking all the known factors into consideration the Committee would urge Government to continue an extension programme on the lines indicated in the final summary as it feels that extra accommodation will be required whatever the final solution. The increase required and indicated over the next two years cannot be delayed : this increase will certainly be required as a permanency and by then the problem will presumably have clarified itself to a great extent.

13. Finally the Committee are of the opinion that clinics, excluding infant welfare and school service clinics, should be extended within the hospital system in the urban area. The requirements outside this system are discussed in the sections dealing with the Government Health Services. That nothing has ever been done for the pre-school child has been sufficiently stressed elsewhere as an appalling waste of administrative effort. Feeding schemes for this particular group are to be continued, very fortunately. That an expansion of the school medical service in this direction, or some other similar expansion, may be required in addition to special child hospital services and clinics has not been lost sight of.

14. The Government Health Department covers the port (air and sea), the rural areas with a population of some quarter of a million souls, and the School Medical Service. While these services have been brought up to their pre-war efficiency in many respects, many of the facilities then available to the Department and so to the public are no longer adequate to meet modern requirements. This is particularly so in respect to Quarantine arrangements, to Air and Port control, and to Maternity and Child Welfare clinics. In addition certain essential services have never been fully initiated, or initiated at all, such as school dental services

and those for the pre-school child. Thus while Singapore has *temporarily* obtained its pre-war standing as one of the healthiest of Eastern ports due to its quarantine control, and its infantile mortality is the lowest ever recorded through the energy and effort of the existing staffs, this cannot continue for long with out-moded facilities and inadequate personnel without disastrous results. What is required, and how this expenditure should be extended to meet a 10 and 15-year plan, is detailed in the final chart attached. A 10-year limit is stressed again as the maximum which should be laid down to bring these services to a state of minimum efficiency.

15. The following items have been listed for the "Development and Welfare Scheme" by your sub-committee for this purpose. So capital expenditure under these heads can be eliminated *if money from this source is approved and is not long delayed:*

	$
Rural Clinics	656,000
St. John's Quarantine Station	526,000
Leper Settlement expansion	780,000
School Medical and Dental clinic	200,000
Quarantine arrangement at Changi Airport ...	270,000

16. The necessity of up-to-date rural maternity and child welfare clinics has been fully stressed in the 1946 survey, and the Rural Board for Singapore and the Singapore Public Health Conference have urged an immediate start in this direction as the most important work to be undertaken in Rural Singapore. We have reached the pre-war level in this respect with an infantile mortality figure below the pre-war, a most laudable effort in view of the fact that many of the clinics are held in shop-houses, a police pound and even under a tree. This is a disgraceful state of affairs after 20 years of effort and one which compares very unfavourably with other colonies I have been in. That the present results have been obtained under prevailing conditions is note-worthy. Sixteen rural clinics and three static dispensaries have been recommended over a six-year period to bring the present organisation into line with modern concepts at a total cost of $776,000. Plans for the purpose have been available for some time.

17. St. John's Island is our main sea-quarantine bulwark against disease from outside. The station has been in the lime-light recently and there have been many criticisms in regard to the arrangements available. An up-to-date water suply at an approximate cost of $250,000 is the most urgent item. Then we must face rehabilitating half the camps and re-designing the rest on the existing foundations and framework at an approximate cost of $552,000. The present accommodation is up to the pre-war standard but this is no longer acceptable to the public.

18. Air control is now as important as sea control and is a new post-war commitment. The exact future policy of the State in this respect has not been finally decided but it is clear that an expenditure of many millions must be made if Singapore is to retain its status as one of the world's travel termini. This necessitates conforming to the International Sanitary Code whether we like it or not. If it was not for the help provided by the R.A.F. it would be impossible to meet our present commitment : this cannot continue indefinitely.

19. One hundred thousand dollars is to be spent in cooly lines and overseers' quarters this year. This programme must be continued until all the labour force is properly housed unless there is to be trouble with the Labour Office.

20. And finally a word on the school medical and dental services and the pre-school child. The dire deficiencies in these respects have been exposed by me time and again. Nothing exists or has ever existed in the way of dental clinics, or clinics for the vast majority of the pre-school children, and although great strides have been made in bringing the medical side of the school medical service to the pre-war level this is far behind what the post-war educational scheme demands. One ludicrously small and overcrowded clinic exists for all these purposes today. There are 91,000 children on the school rolls alone. A start will be made with the dental services this year. A proper clinic with a further expansion of the medical work and a steady increase in the dental field must be faced without any further delay. It may be necessary to ask for one or two subsidiary clinics later on but as these are not likely to be very expensive items in regard to total expenditure, these have been omitted from further reference for the present.

21. A tremendous amount has been done in the anti-malarial field over the past two years and a further expansion in more permanent measures will have to be created : but this has been put at the end of the list as work of a more temporary nature should suffice while more urgent matters are under action.

22. FINAL.—After the most exhaustive consideration a final summary is attached to cover the colony's major requirements over a 10 and a 15-year period as requested, and this report should be studied in connection with the 1946 review. Only outlines have been sketched in in this memorandum and a tremendous amount of work must go to complete exact details. As your Adviser on these matters I have to recommend a 10-year limit as the minimum to meet this plan. You have asked for an assessment over the period and I trust this bird's eye view has answered the immediate requirement. In the view of both expert committees which have studied the requirements of the Colony of Singapore in the medical field it cannot be too strongly emphasised that the success or failure of any hospital or health service depends on a contented, properly housed and adequate staff, no less than on adequate and sufficient buildings. A minimum building programme has been outlined on a priority basis; while this is going on staff must be obtained and trained. Thus accommodation is the first stage from the hospital side in addition to an early decision on pay and like aspects of our problem.

Singapore's medical budget this year is more than it has ever been. Excluding the College of Medicine which is Pan-Malayan, it approximates to just over a seven million total with some half a million on capital expenditure. Yet to cover an equal population in England or America four times this amount is being spent only to run existing services apart from the capital expenditure we require to reach a reasonably adequate standard. Half our present annual total is given over to Tuberculosis services alone in such places.

W. J. VICKERS,
Director, Medical Services
Singapore.

February, 1948

10 YEARS' PLAN = 5 MILLION
15 YEARS' PLAN = 3.33 MILLION
(*N.B.* "M"

No.	Institution	1948	1949	1950	1951	1952	1953	1954
1.	Base Medical Store Pharmacy School and Essential Manufactory	200,000 *add*	250,000 200,000	250,000 200,000	— 100,000	—	—	—
2.	Lepers	100,000 *add*	200,000 200,000	200,000 100,000	280,000 100,000	— 100,000	— 100,000	— 80,000
3.	General Hospital, 1,500 beds	(246,200)	1½ M 1 M	1½ M 1 M	2 M 2 M	2½ M 2 M	3 M 2 M	3 M 2 M
4.	Kandang Kerbau Maternity Hospital	(55,000)	½ M ½ M	1 M ½ M	1 M ½ M	1 M ½ M	1 M 1 M	1 M 1 M
5.	Rural Clinics	82,000 *add*	200,000 82,000	200,000 82,000	200,000 82,000	94,000 82,000	— 82,000	— 82,000
6.	St. John's Island Water Supply	—	250,000 250,000	—	—	—	—	—
7.	School Medical and Dental Clinics	—	200,000 100,000	— 100,000	—	—	—	—
8.	Sea and Air Ports	?	150,000 150,000	200,000 150,000	200,000 100,000	100,000 100,000	100,000 50,000	72,000 50,000
9.	Venereal Disease Hospital	(130,000)	—	½ M —	½ M —	1 M —	1 M —	1 M —
10.	Orthopaedic Hospital	If to buy *add*	200,000 100,000	200,000 50,000	200,000 50,000	100,000 50,000	— 50,000	— 50,000
11.	Expansion part—Tan Toek Seng Hospital	(100,000)	50,000 50,000	50,000 50,000	100,000 50,000	200,000 50,000	200,000 50,000	200,000 50,000
12.	Rural Coolie Lines	100,000 *add*	100,000 50,000	100,000 50,000	50,000 50,000	50,000 50,000	50,000 50,000	50,000 50,000
13.	Anti-Malarial	—	—	—	—	—	—	100,000 —
14.	One or two District Hospitals up to a 500 beds total	—	—	—	—	—	—	—
15.	Expansion Infectious Disease	—	—	—	—	—	—	—
16.	Mental Hospital Improvement	(50,000)	80,000 80,000	100,000 100,000	200,000 100,000	200,000 100,000	200,000 100,000	200,000 100,000
	Total		3.68 M 2.76 M	4.3 M 2.38 M	4.73 M 3.13 M	5.24 M 3.03 M	5.55 M 3.48 M	5.62 M 3.42 M
	Annually Recurrent Total ..	7½ M	7½ M 7½ M	7¾ M 7½ M	8 M 7¾ M	8½ M 8 M	9 M 8½ M	9½ M 8¾ M

N.B.—The annually recurrent figure is based throughout on present estimates
tions. While such considerations as these will advance these estimates it is
falling prices particularly in food.

PER ANNUM = UPPER LINE.
PER ANNUM = LOWER LINE.
denotes Million).

1955	1956	1957	1958	1959	1960	1961	1962	1963	Total excluding 1948
—	—	—	—	—	—	—	—	—	700,000
—	—	—	—	—	—	—	—	—	780,000
2½ M 2 M	— 2 M	— 2 M	—	—	—	—	—	—	16 Million
1 M 1 M	— 1 M	— ½ M	—	—	—	—	—	—	6½ Million
— 82,000	— 80,000	— 40,000	—	—	—	—	—	—	776,000
—	—	—	—	—	—	—	—	—	250,000
—	—	—	—	—	—	—	—	—	200,000
— 50,000	— 50,000	— 50,000	— 72,000	—	—	—	—	—	822,000
½ M —	— ½ M	— ½ M	— ½ M	— ½ M	— ½ M	— ½ M	— ¾ M	— ¾ M	4½ Million
200,000 50,000	200,000 —	— —	— 200,000	— 200,000	— 200,000	— 100,000	—	—	1.1 Million
200,000 50,000	200,000 50,000	80,000 50,000	— 100,000	— 100,000	— 100,000	— 150,000	— 250,000	— 100,000	1¼ Million
250,000 50,000	250,000 50,000	550,000 50,000	500,000 50,000	— 250,000	— 250,000	— 250,000	— 250,000	— 400,000	2 Million
100,000 —	100,000 50,000	100,000 50,000	100,000 50,000	— 50,000	— 50,000	— 50,000	— 50,000	— 150.000	— 500,000
—	3 M —	4 M —	4 M 2 M	— 2 M	— 2 M	— 2 M	— 1½ M	— 1½ M	11 Million
—	½ M —	½ M —	½ M ¼ M	— ¼ M	— ¼ M	— ¼ M	— ¼ M	— ¼ M	1½ Million
200,000 100,000	200,000 100,000	250,000 100,000	250,000 100,000	— 100,000	— 200,000	— 200,000	— 200,000	— 200,000	1.88 Million
4.95 M 3.38 M	4.45 M 3. 8 M	5.48 M 3.33 M	5.35 M 3.32 M	— 3.45 M	— 3.55 M	— 3.55 M	— 3.25 M	— 3.5 M	Approximately 49½ Million
10 M 9 M	10½ M 9½ M	11¾ M 9¾ M	11¼ M 10 M	12 M 10½ M	12 M 11 M	12 M 11 M	12 M 11 M	12 M 12 M	

excluding non-pensionable allowances and Salaries Commission recommenda-
to be hoped that they will be more than counterbalanced in due course by

Ref. DMS(S) 41/1947. **Annexure C.**
CSO Conf. 03/1947.

THE MEDICAL PLAN AND HOW IT AROSE.

At the request of His Excellency a five-year Medical Plan was drawn up and published as a paper for the Advisory Council in February, 1947. It was No. 12 of 1947. This memorandum indicated the main broad outline of capital expenditure required to bring the Hospital Services, the Quarantine Services, the School Medical and Dental Services and the Rural Health Service up to modern requirements.

2. Since my return from leave His Excellency has asked for a revision of this Plan on a ten and fifteen-year basis and this is (19) in this file with a complete financial summary. The opportunity was taken to modify the original plan in regard to the extended use of the existing General Hospital with one or two District accident Hospitals later on instead of building a second 1,000-bedded hospital both as an economy measure and particularly to speed up planning.

3. The present Hospital Services are only capable of dealing with a population of a quarter of a million people. Steps were in hand in 1940 to expand them considerably and a further eight years has meant an added quarter of a million people. The most pressing need is housing of staff and this was fully recognised in 1940. As this expands more staff will be recruited and trained which will be ready to take its place by the time added bed strength is available. Clinics of various sorts such as T.B. must be provided as a part of the Hospital Services. *To summarise:* the present hospitals system cannot cope with and is quite incapable of coping with the 1948 population.

4. The Quarantine Station and Service is coming in for a lot of criticism because the facilities which existed for 20 years before the war are not acceptable in 1948. A considerable building programme is required. Air quarantine is practically a new post-war issue. Without an adequate and satisfactory Quarantine Service the commercial life of Singapore is imperilled.

5. The School Medical Service is merely at a beginning although this has reached the pre-war level. Clearly it is incapable of dealing with the extended educational programme without considerable expansion. *For the first time a start* is being made with a school dental service this year. Yearly expansion is essential to the educational plan also.

6. A lot of capital expenditure is required in the Rural areas to bring an outmoded organisation up-to-date. Thus hardly any proper child clinics exist after 20 years of work: leprosy has got out of hand during the Japanese occupation.

7. The capital expenditure programme must be considered as a minimum one. Even when this is completed we shall only be spending some 12 million dollars as an annually recurrent expenditure when some 2½ times this amount is being spent today annually for a similar population in the United Kingdom and America.

8. If the Colony cannot face the expenditure outlined then we must be prepared to say that we cannot give an adequate and reasonable medical Service to the Colony. Nevertheless the sum we *can* spend over a period should be clearly indicated so that I can plan properly with what is available. I have to recommend ten years as a minimum planning space in view of the tremendous leeway which has to be made up.

9. The Advisory Council Paper on this subject should be read in conjunction with my new memorandum to His Excellency to fully grasp our medical problem.

W. J. VICKERS,
Director of Medical Services,
Singapore.

SINGAPORE, 31*st March*, 1948.

APPENDIX I

TOTAL NUMBER OF PERMANENT OFFICERS (A) AUTHORISED AND (B) AVAILABLE ON 31-12-1947

———	1941 Authorised-Available		1947 Authorised-Available	
(A)—ADMINISTRATIVE				
Director	1	1	1	1
Chief Health Officer	1	1	1	1
Chief Medical Officer	1	1	1	1 (acting)
Secretary, General Hospital	1	1	1	1
(B)—HOSPITALS DIVISION				
Specialists (including Clinical College posts)	15	15	16	8 (+ 5 acting(
Medical Officers (including Clinical Assistants)	56	51	59	33
Matrons	6	6	6	6
Sisters:—				
(a) expatriate	56	56	52	38
(b) local	..	..	..	7
Staff Nurses	79	74	86	86
Nurses	200	205	212	139
Hospital Assistants	145	145	156	156
Dental Staff (including College)				
Qualified				
(a) expatriate	3	3	3	2
(b) local	3	3	3	1
Rest	2	2	2	..
Pharmacists (including College)				
(a) expatriate	2	2	2	1
(b) local	3	3	3	2
Laboratory Assistants	11	11	11	8
(C)—HEALTH DIVISION				
Health Officers	16	16	19	7
Chief Sanitary Inspector	1	1	1	1
Sanitary Inspectors	8	8	10	10
Matron	1	1	1	1
Sisters (local)	2	2	2	1
Staff Nurses	1	1	12	12
Nurses	13	13	10	5

APPENDIX *II*

LEGISLATION

During the period under review the following legislation was passed:—

1. *The Hydrogen Cyanide (Fumigation) Ordinance, 1947.*—an Ordinance to regulate the fumigation of premises and articles with hydrogen cyanide.

2. *The Hydrogen Cyanide (Fumigation) Regulations, 1947.*—regulations under the above Ordinance.

3. *The Food and Drugs Regulations, 1947.*—Regulations under The Sale of Food and Drugs Ordinance regarding the standard, strength, weight, quality or quantity of food or drugs sold.

4. *The Rural Board (Theatre) By-Laws, 1947.*—By-laws under the Muncipal Ordinance pertaining to the building and supervision of theatres.

5. Quarantine (Emergency Cholera) Measures—Measures under the Quarantine and Prevention of Diseases Ordinance designed for the prevention of cholera epidemic.

APPENDIX *III*

ANTI-MALARIAL WORKS CARRIED OUT IN THE YEAR, 1947

Locality	Materials used						Work done			
	Subsoil Pipes	Channels	Slabs	Bricks	Cement	A. M. Oil	No. of yds. of drain maintained	No. of yds. of open drain	No. of yds. of open drain repaired	No. of yds. of Subsoil pipes repaired
					Bags					
Pasir Panjang ..	150	..	..	..	10	4,933	8,000	..	790	330
Bukit Timah ..	3,000	..	..	..	..	8,909	5,880	..	1,475	1,283
Bukit Panjang ..	2,325	50	..	25,000	421	5,367	3,520	70	207	2,325
Sembawang ..	..	8	3	200	4	4,204	9,560	..	100	20
Serangoon.. ..	2,560	1,262	242	4,450	304	3,934	7,040	1,060	1,391	577
Bedok	10	..	30	..	2	5,264	12,320	..	..	1,500
Changi	1,240	20	85	20	42	2,680	8,800	..	231	1,240
Total ..	9,285	1,340	360	29,670	783	35,291	55,120	1,130	4,194	7,275

APPENDIX *IV*

SUMMARY OF WORK CARRIED OUT BY DISTRICT SANITARY INSPECTORS DURING 1947

I. INFECTIOUS DISEASES AND DISINFECTIONS—

No. of cases of Plague	—
Small-pox	4
Cholera	—
Diphtheria	14
Measles	—
Enteric	1
Chicken-pox	29
Other infectious diseases ..	8

II. INSPECTION AND SANITATION—

No. of inspections	
House to house ..	14,304
Police Stations ..	181
Schools	1,109
Government buildings ..	993
No. of sanitary cards issued	—
No. of buildings with insanitary latrines ..	2,079
No. of buildings with insanitary urinals ..	508
No. of latrines inspected	13,554
No. recommended reconstruction ..	749
No. of latrines abolished	330
No. of latrines constructed or reconstructed	442
No. of bore hole latrines constructed ..	8
No. of night-soil pails on removal list ..	5,101
Daily average amount of refuse in cubic ft.	3,434
No. of village incinerators serviceable ..	5
No. of village incinerators unserviceable ..	6
No. of buildings with inadequate drainage	532
No. of linear yards drains cleared daily ..	5,423
No. of linear yards new earth drains dug	32,573
No. of linear yards masonary drains constructed	157
No. of linear yards masonary drains repaired	721
No. of linear yards subsoil drains constructed	127
No. of linear yards subsoil drains repaired	2,705

III. BUILDINGS—

No. of permits issued	58
No. of permits rejected	7
No. of plans passed	73
No. of plans approved conditionally ..	30
No. of plans rejected	6
No. of new buildings erected	97
No. of buildings reconstructed ..	34
No. of buildings condemned	10
No. of buildings demolished	13

APPENDIX *IV—continued*

IV. FACTORIES, WORKSHOPS AND OFFENSIVE TRADES—		
Total inspected		6,908
Factories and Godowns	1,296	
Others	5,612	
V. FOOD—TOTAL INSPECTIONS		22,985
Eating-houses	8,700	
Coffee Shops	3,869	
Butcher Shops and Slaughter Houses	844	
Fishmongers	1,777	
Grocers	2,830	
Markets	2,388	
Milk Vendors	1,090	
Bake-Houses	1,487	
Hawkers	2,540	
VI. KEEPING OF ANIMALS—	TOTAL INPECTIONS	2,158
Cowsheds	604	
Piggeries	1,516	
Goat pens	32	
Others	6	
Nuisances in Cowsheds		128
Nuisances in Piggeries		616
Goat pens		4
VII. GENERAL—		
Water—No. of samples taken for examination from wells, etc.		7
Rats—No. of rats submitted for examination		253
Complaints—No. received		975
Interviews with agents and owners		6,114
No. of intimation notices served		146
No. complied with		94
No. of nuisances notices served		86
No. complied with		47
No. of anti-mosquito notices served		158
No. complied with		40
No. of new lepers discovered		6
VIII. PROSECUTIONS—		
Total number		51
Results of prosecutions	Total fines	$560

APPENDIX *V*

MATERNITY AND CHILD HEALTH RURAL CENTRES

———	December 1947	4th Quarter 1947	Year 1947
Visits to Homes by Health Nurses	5,000	13,765	50,732
Midwives' Work			
Home Visits, Pre-natal	355	1,032	3,901
Confinements attended	448	1,445	5,215
Nursing Visits to Mothers and Babies . .	2,344	7,681	27,841
Patients in labour sent to Hospital	11	30	94
Attendances at Clinics			
Pre-natal	837	2,813	7,157
Infants under one year	5,197	15,033	60,060
Children over one year examined and treated . .	1,533	4,896	23,292
Vaccinations	766	2,486	14,317
Examination of Private Midwives	29	75	326
Total Sessions	121	369	1,511

APPENDIX *VI*

RETURN OF MILK DISTRIBUTION AT RURAL HEALTH CLINICS FOR 1947

Clinics	Number of Feeds		Total	Amount used Powdered Milk	Condensed Milk (sweet)	Skimmed Milk
	Mothers	Children				
				lbs.	lbs.	lbs.
Pasir Panjang and Islands	67,915	57,905	125,820	4,194	. .	. .
Bukit Timah Jurong Rd.	50,474	26,386	76,860	2,562	. .	. .
Bukit Panjang and L. C. Kang	36,568	16,570	53,138	1,676	. .	. .
Seletar	100,979	33,451	134,430	4,297	228	. .
Tai Seng and Yio Chu Kang	18,241	16,058	34,299	1,182½	32	. .
Upper Serangoon . .	25,582	16,228	41,810	1,401½	1	. .
Malay Settlement . .	22,065	24,434	46,499	1,467	7	. .
East Coast Road and Ulu Bedok	42,848	30,172	73,020	2,356	14	112
Changi and Pulau Tekong	19,000	28,270	47,270	1,620	7	. .
Total . .	383,672	249,474	633,146	20,756	289	112

APPENDIX *VII*

WORK COVERED BY MOBILE DISPENSARIES

In Kampongs

Abrasions	15
Abscess	2
Anæmia	443
Anorexia	7
Amblyopia	1
Ascaviasis	401
Asthma	76
Beri-beri	240
Bronchitis	818
Boils	4
Constipation	36
Conjunctivitis	177
Contusion	1
Debility	229
Diarrhœa	104
Dysuria	1
Dyspepsia	19
Dermatitis	1
Eczema	96
Flatulence	5
Gastritis	159
Gingivitis	2
Influenza	307
Impetigo	1
Lacerated wounds	23
Lumbago	3
Malaria	5
Mumps	1
Myalgia	8
Neuralgia	1
Otorrhœa	82
Onychia	6
Pyrexia	70
Ringworm	28
Scabies	479
Scald	1
Seborrhœa (Scalp)	7
Tonsillitis	2
Sores	297
Ulcers	564
Others	130

In Schools

Abrasions	25
Anæmia	1
Boils	2
Bronchitis	750
Conjunctivitis	29
Diarrhœa	1
Eczema	55
Influenza	104
Lacerated wounds	15
Otorrhœa	49
Ringworm	17
Scabies	635
Seborrhœa	1
Sores	1,081
Ulcers	391
Others	76

New Cases	5,238
School Cases	3,341
Repetitions	12,857
Revaccinations	3,435

APPENDIX *VIII*

ST. JOHN'S ISLAND QUARANTINE STATION 1947

Total passengers admitted during the year ..	56,378
Greatest number admitted on any one day ..	2,103
Maximum number in residence on any one day ..	2,653
Minimum number in residence on any one day ..	1
Total deaths during the year in hospital ..	10
Death rate per mille amongst passengers admitted	0.177
Number of Municipal Contacts admitted ..	341
Number of Government Contacts admitted ..	5
Number of Municipal Contacts who developed infectious diseases on the island	1
Gallons of Singapore water provided ..	6,153,728
Average stay of Contacts (days)	7.2

Passengers divided by race:—

Chinese	47,580
North Indians	2,534
South Indians	5,660
Malays and Javanese ..	587
Eurasian	—
Japanese	—
Others	17
	56,378

HOSPITAL—ST. JOHN'S ISLAND

Number of cases treated	129
Total number of deaths	10
Average daily number of patients in hospital ..	0.35
Total number of vaccinations	51,777
Total number revaccinations	12
Total number anti-cholera vaccinations ..	324
Total outpatients treated	1,080
Total attendances	1,993
Total number of births	23

APPENDIX *IX*

INPATIENTS—ALL HOSPITALS

The following table shows the hospitals maintained by the Medical Department, Singapore, the daily average number of patients in each, the number of patients admitted during the year, the total number of patients treated, the number of deaths and the death rate per hundred treated. (The Quarantine Hospital and Leper Settlement are not included).

Hospitals	Average daily number of patients	Admissions during the year	CASES TREATED DURING YEAR			Deaths	Mortaley-per cent
			Male	Female	Total		
General	528.93	14,676	11,243	3,856	15,099	1,744	11.5
Tan Tock Seng (Tuberculosis and General)	478.51	2,330	2,492	252	2,744	585	21.3
Kandang Kerbau (Maternity and Gynaecology)	200.00	9,975	..	10,325	10,325	92	0.9
Police	12.11	818	830	..	830	..	..
Prison	62.05	1,807	1,842	..	1,842	2	0.1
Mental	565.00	773	709	447	1,156	95	8.2
St. Andrew's Orthopaedic	55.00	63	57	66	123	3	2.4
Social Hygiene	42.80	2,129	497	1,671	2,168	5	0.2
Middleton Infectious	36.70	1,389	1,011	437	1,448	51	4.3
Total		33,960	18,681	17,054	35,735	2,577	7.2

N.B.—Total cases treated in 1946 = 25,570.

APPENDIX *X*

ALL HOSPITALS, SINGAPORE IN-PATIENTS**

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1947	Remarks
		Admissions	Deaths			
I.—*Infectious and Parasitic Diseases*						
1. Typhoid fever	1	131	20	132	9	
2. Paratyphoid fever ..	..	6	..	6	..	
3. Typhus:—						
(1) Other than Tropical typhus ..	..	9	1	9	1	
(2) Tropical typhus 'x 19'(or W or Urban)	..	6	..	6	..	
(3) Tropical typhus 'K' (or rural), or Tsutsugamushi fever	1	9	1	10	..	
(4) Other rickettsia infections ..	..	..	..	..	..	
4. Relapsing fever ..	..	..	..	..	..	
5. Undulant fever ..	..	..	..	..	..	
6. Small-pox	17	41	11	58	..	
7. Measles	1	49	1	50	..	
8. Scarlet fever	..	..	..	..	..	
9. Whooping cough ..	1	15	1	16	..	
10. Diphtheria	11	155	23	166	16	
11. Influenza	3	127	4	130	..	
12. Cholera	..	..	..	..	..	
13. Dysentery:—	..					
(1) Amœbic ..	7	146	11	153	3	
(2) Bacillary ..	1	34	7	35	..	
(3) Mixed	..	..	..	..	..	
(4) Undefined or due to other causes ..	2	19	2	21	3	
14. Plague:—						
(1) Bubonic ..	..	..	..	..	..	
(2) Pneumonic ..	..	..	..	..	..	
(3) Septicæmic ..	..	..	..	..	..	
(4) Undefined ..	..	..	..	..	..	
15. Erysipelas	..	6	..	6	..	
16. Acute poliomyelitis or polioencephalitis ..	34	13	..	47	17	
17. Encephalitis lethargica ..	..	1	1	1	..	
18. Cerebro-spinal fever ..	1	35	7	36	..	
19. Glanders	..	..	..	..	..	
20. Anthrax	..	..	..	..	..	
21. Rabies	..	..	..	..	..	
22. Tetanus:—						
(1) Tetanus of the newly born.. ..	1	89	76	90	3	
(2) Other forms of tetanus ..	..	53	27	53	2	
Carried forward ..	81	944	193	1,025	54	

The form shows in the main the arrangement of diseases in the *International Nomenclature, 1931 Edition.* To save space the unimportant diseases of any class can be grouped in their places as "Other Diseases" of the Class.

* *i.e.* the year previous to that for which the return is made.

** Excluding Quarantine and Leper Hospitals.

† "Total cases treated" will, of course, include those remaining in Hospital at the end of the previous year.

‡ The figures in this column to be carried on to the next year's Return.

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	81	944	193	1,025	54	
I.—*Infectious and Parasitic Diseases*—(contd.)						
23. Tuberculosis of the respiratory system	232	1,238	476	1,470	332	
24. Tuberculosis of the central nervous system ..	..	92	85	92	2	
25. Tuberculosis of the intestines or peritoneum ..	1	16	6	17	1	
26. Tuberculosis of the vertebral column	19	51	4	70	18	
27. Tuberculosis of other bones and joints	30	65	1	95	56	
28. Tuberculosis of the skin or subcutaneous tissue (Lupus)	..	1	..	1	1	
29. Tuberculosis of the lymphatic system .. .. (abdominal and bronchial glands excepted)	1	18	1	19	1	
30. Tuberculosis of the genito-urinary system ..	..	11	1	11	1	
31. Tuberculosis of other organs	..	4	2	4	..	
32. Tuberculosis disseminated ..	..	38	29	38	..	
33. Leprosy	..	14	..	14	5	
34. Syphilis (also *see* 35 (7)):—						
(1) Primary ..	2	121	..	123	1	
(2) Secondary ..	26	415	4	441	27	
(3) Tertiary ..	2	234	2	236	..	
(4) Hereditary ..	2	137	9	139	5	
(5) Period not indicated	13	429	12	442	18	
35. Other venereal diseases:—						
(1) Soft chancre ..	3	130	..	133	1	
(2) Gonorrhœa ..	8	686	..	694	12	
(3) Gonorrhœal ophthalmia	..	43	..	43	2	
(4) Other gonorrhœal complications ..		140	..	140	5	
(5) Granuloma venereum ..	..	3	..	3	..	
(6) Tropical bubo (Lympho-granuloma inguinale) ..	..	34	..	34	..	
(7) Mixed venereal infections ..	3	161	..	164	3	
Carried forward ..	423	5,025	825	5,448	545	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	423	5,025	825	5,448	545	
I.—*Infectious and Parasitic Diseases*—(contd.)						
36. Purulent infective septicæmia or Pyæmia	..	18	7	18	1	
37. Yellow fever	..	..	..	..	..	
38. Malaria:—						
(1) Tertian (Benign) ..	2	131	..	133	1	
(2) Quartan ..	..	1	..	1	..	
(3) Aestivo-autumnal .. (Subtertian)	9	253	39	262	1	
(4) Mixed infections ..	..	7	..	7	1	
(5) Unclassified ..	6	385	6	391	14	
(6) Cachexia ..	..	5	..	5	1	
(7) Blackwater fever ..	..	..	..	..	..	
39. Other diseases due to Protozoa:—						
(1) Yaws (frambœsia) ..	..	8	..	8	..	
(2) Spirochætosis icterohæmorrhagica ..	..	15	3	15	..	
(3) Leishmaniasis (dermal) ..	..	..	..	..	..	
(4) Kala azar ..	..	2	..	2	..	
(5) Other diseases ..	..	17	..	17	1	
40. *See* 42 (6)		..	..	..	..	
41. *See* 42 (3)		..	..	..	..	
42. Other diseases due to Helminths:—						
Cestodes						
(1) Tænia solium ..	..	..	..	..	..	
(2) Tænia saginata ..	..	..	..	..	..	
(3) Other cestodes, including hydatid cyst	..	..	..	..	..	
Nematodes						
(4) Filaria ..	..	4	..	4	..	
(5) Ascaris ..	1	192	11	193	..	
(6) Ankylostoma ..	4	91	..	95	1	
(7) Oxyuris vermicularis	..	..	..	..	..	
(8) Dracunculus medinensis ..	..	..	..	..	..	
Carried forward ..	445	6,154	891	6,599	566	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	Yearly Total		†Total cases treated	‡Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	445	6,154	891	6,599	566	
I.—*Infectious and Parasitic Diseases*—(contd.)						
42.—Other diseases due to Helminths:—(contd.)						
Trematodes						
(9) Schistosomum japonicum ..	..	..	..	..	..	
(10) Clonorchis sinensis ..	..	..	..	..	..	
(11) Other helminths ..	..	10	..	10	..	
43.—(1) Sprue	..	1	..	1	1	
(2) Actinomycosis ..	..	3	..	3	..	
(3) Other mycotic infections excluding purely dermal mycosis ..	..	18	..	18	..	
44. Other infectious or parasitic diseases:—						
(1) Vaccinia including post vaccinal encephalitis ..	..	1	..	1	..	
(2) Other sequelæ of vaccination ..	..	1	..	1	..	
(3) Rubella ..	..	86	..	86	..	
(4) Varicella (chicken-pox) ..	7	324	..	331	22	
(5) Mumps and its complications ..	6	255	..	261	1	
(6) Dengue ..	..	33	..	33	1	
(7) Melioidosis ..	..	..	..	..	..	
(8) Myiasis ..	..	..	..	..	..	
(9) Glandular fever ..	..	1	..	1	..	
(10) Others ..	..	..	..	..	..	
II.—*Cancer and other Tumours*						
45. Cancer or other malignant diseases of the buccal cavity, and pharynx and œsophagus	..	40	10	40	6	
Carried forward ..	458	6,927	901	7,385	597	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	458	6,927	901	7,385	597	
II.—*Cancer and other Tumours* —(contd.)						
46. Cancer or other malignant tumours of the digestive organs, and peritoneum:—						
(1) Stomach ..	1	41	15	42	3	
(2) Liver	..	48	25	48	3	
(3) Other digestive organs ..	4	50	19	54	2	
47. Cancer or other malignant tumours of the respiratory organs	..	26	13	26	1	
48. Cancer or other malignant tumours of the uterus ..	..	34	..	34	2	
49. Cancer or other malignant tumours of other female genital organs ..	..	12	2	12	..	
50. Cancer or other malignant tumours of the breast ..	..	30	1	30	..	
51. Cancer or other malignant tumours of the male genito-urinary organs ..	2	16	5	18	1	
52. Cancer or other malignant tumours of the skin ..	1	14	4	15	..	
53. Cancer or other malignant tumour of organs not specified	4	68	14	72	..	
54. Tumours non-malignant:—						
(1) Of female genital organs ..	..	103	1	103	..	
(2) Of other sites ..	1	95	2	96	4	
55. Tumours of undetermined nature:—						
(1) Female genital organs ..	..	2	..	2	..	
(2) Other sites ..	3	27	4	30	..	
Carried forward ..	474	7,493	1,006	7,967	613	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	474	7,493	1,006	7,967	613	
III.—*Rheumatism, Diseases of Nutrition and of Endocrine Glands and other General Diseases*						
56. Rheumatic Fever:—						
(1) With cardiac involvment ..	..	39	14	39	3	
(2) Without cardiac involvment ..	2	45	2	47	1	
57. Rheumatism and Arthritis (non-suppurative) ..		82	1	82	5	
58. Gout	..	2	..	2	..	
59. Diabetes (not including diabetes insipidus) ..	2	75	6	77	1	
60. Scurvy (including Barlow's disease)	..	..	..	..	..	
61.—(1) Beri-beri including epidemic dropsy ..		52	15	52	8	
(2) Beri-beri associated with pregnancy or labour	..	5	1	5	..	
62. Pellagra	1	1	..	2	..	
63. Rickets	..	47	3	47	2	
64. Other diseases due to hypovitaminosis	..	4	..	4	3	
65. Diseases of the pituitary gland	..	1	..	1	..	
66. Diseases of the thyroid and parathyroid glands:—						
(1) Simple goitre ..	..	14	1	14	..	
(2) Exophthalmic goitre	2	25	4	27	3	
(3) Myxœdema, cretinism ..	2	..	..	2	..	
(4) Tetany ..	..	1	..	1	..	
(5) Others ..	1	1	..	2	..	
67. Diseases of the thymus ..	..	..	..	..	..	
68. Diseases of the adrenal glands (excluding tuberculosis) ..	..	..	..	..	..	
69. Other diseases of metabolism, etc.	2	5	5	7	..	
Carried forward ..	486	7,892	1,058	8,378	639	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	486	7,892	1,058	8,378	639	
IV.—*Diseases of the Blood and Blood Forming Organs*						
70. Hæmorrhagic conditions:—						
(1) Purpura ..	1	9	3	10	1	
(2) Hæmophilia ..	..	3	1	3	..	
71. Anæmia and chlorosis:—						
(1) Pernicious anæmia ..		6	3	6	..	
(2) Splenic anæmia ..		4	1	4	1	
(3) Chlorosis ..		..	..	..	..	
(4) Secondary anæmia ..	10	91	13	101	10	
(5) Tropical macrocytic anæmia ..	2	32	5	34	3	
(6) Others ..	1	164	29	165	9	
72. Leukæmia:—						
(1) Leukæmia ..	1	7	4	8	1	
(2) Hodgkin's disease ..	..	8	2	8	..	
73. Diseases of the spleen not elsewhere mentioned ..	..	2	..	2	..	
74. Other diseases of the blood and blood forming organs	..	..	..	..	..	
V.—*Chronic Poisoning*						
75. Alcoholism (acute or chronic) including inebriety ..	..	48	..	48	..	
76. Poisoning by other organic substances (not by violence):—						
(1) Opium ..	..	9	1	9	..	
(2) Morphia, cocaine ..	..	1	1	1	..	
(3) Others ..	..	3	..	3	..	
77. Poisoning by mineral substances (not by violence):—						
(1) Lead	..	..	..	..	..	
(2) Arsenic ..	1	20	3	21	..	
(3) Others ..	..	11	..	11	..	
VI.—*Diseases of the Nervous System and Sense Organs*						
78. Encephalitis (not including encephalitis lethargical):—						
(1) Cerebral abscess ..	1	6	6	7	..	
(2) Other forms of encephalitis ..	..	22	8	22	..	
Carried forward ..	503	8,338	1,138	8,841	664	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	503	8,338	1,138	8,841	664	
VI.—*Diseases of the Nervous System and Sense Organs*—(contd.)						
79. Meningitis (not including tuberculous meningitis or cerebro-spinal meningitis)	3	56	22	59	1	
80. Tabes dorsalis (Locomotor ataxia)	..	18	4	18	6	
81. Other diseases of the spinal cord	1	11	4	12	..	
82. Cerebral vascular accidents ..	2	123	42	125	8	
83. General paralysis of the insane	1	8	2	9	8	
84. Other forms of insanity, *i.e.* not 83, 150 (1), 162 (1), or 203	383	765	93	1,148	661	
85. Epilepsy	1	47	1	48	4	
86. Infantile convulsions .. (age under 5 years)	..	6	2	6	1	
87. Other diseases of the nervous system:—						
(1) Chorea ..	..	4	1	4	..	
(2) Neuritis and neuralgia	3	38	..	41	5	
(3) Paralysis agitans ..	17	24	4	41	21	
(4) Disseminated sclerosis	..	1	..	1	..	
(5) Neurasthenia ..	1	13	..	14	..	
(6) Hysteria ..	1	15	..	16	..	
(7) Others ..	1	33	..	34	3	
88. Diseases of the eye:—						
(1) Conjunctivitis ..	1	180	..	181	5	
(2) Trachoma ..	5	32	..	37	3	
(3) Corneal ulcer ..	..	33	..	33	2	
(4) Cataract ..	16	311	..	327	15	
(5) Others ..	34	461	1	495	37	
89. Diseases of the ear and/or the mastoid sinus:—						
(1) Otitis externa ..	..	35	..	35	..	
(2) Otitis media and its complications ..	1	83	1	84	2	
(3) Others ..	..	4	..	4	..	
Carried forward ..	974	10,639	1,315	11,613	1,446	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remain-ing at end of 1946	Yearly Total		†Total cases treated	‡Remain-ing at end of 1947	Remarks
		Admis-sions	Deaths			
Brought forward . .	974	1,0639	1,315	11,613	1,446	
VII.—*Diseases of the Circulatory System*						
90. Pericarditis	. .	5	3	5	. .	
91. Acute endocarditis:—						
(1) Malignant . .	. .	3	1	3	. .	
(2) Others (not included elsewhere) . .	. .	17	11	17	. .	
92. Chronic endocarditis: valvular disease (except due to specific cause elsewhere stated)	. .	64	11	64	1	
93. Diseases of the myocardium (except due to specific cause elsewhere stated) . .	. .	13	8	13	. .	
94. Diseases of the coronary arteries (including Angina pectoris)	. .	13	6	13	. .	
95. Other diseases of the heart (unless due to specific cause elsewhere stated):—						
(1) Auricular fibrillation	. .	11	2	11	1	
(2) Heart block . .	3	8	1	11	3	
(3) Others . .	4	17	8	21	3	
96. Aneurysm (unless due to specific cause elsewhere stated):—						
(1) Aneurysm of aorta . .	1	4	2	5	1	
(2) Aneurysm of other arteries . .	. .	11	. .	11	. .	
97. Arterio-sclerosis (other than (82), etc.)	. .	15	4	15	1	
98. Gangrene	3	22	4	25	4	
99. Other diseases of the arteries	. .	5	. .	5	. .	
100. Diseases of the veins:—						
(1) Varicose veins . .	1	17	. .	18	. .	
(2) Hæmorrhoids . .	5	178	. .	183	3	
(3) Phlebitis . .	. .	2	. .	2	. .	
(4) Thrombosis . .	. .	11	1	11	2	
(5) Others . .	. .	6	. .	6	. .	
101. Diseases of the lymphatic system:—						
(1) Lymphangitis . .	1	5	. .	6	. .	
(2) Lymphadenitis . .	. .	60	. .	60	4	
(3) Bubo (non-specified)	1	16	. .	17	. .	
102. Abnormalities of blood pressure:—						
(1) High blood pressure	2	146	38	148	6	
(2) Low blood pressure	. .	2	. .	2	. .	
Carried forward . .	995	11,290	1,415	12,285	1,475	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ...	995	11,290	1,415	12,285	1,475	
VII.—*Diseases of the Circulatory System*—(contd.)						
103. Other diseases of the Circulatory system:—						
(1) Epistaxis ..	..	10	..	10	2	
(2) Others (including unexplained hæmorrhages) ..	..	5	1	5	..	
VIII.—*Diseases of the Respiratory System*						
104. Diseases of the nasal fossæ and its annexa:—						
(1) Diseases of the nose	..	126	1	126	..	
(2) Diseases of the accessory nasal sinuses	1	97	..	98	1	
105. Diseases of the larynx:—						
(1) Laryngismus stridulus ..	..	..	..	..	..	
(2) Laryngitis (acute or chronic, of non-specific etiology)	..	19	..	19	1	
(3) Other diseases of the larynx ..	..	1	..	1	..	
106. Bronchitis:—						
(1) Acute	..	98	..	98	4	
(2) Chronic ..	..	25	1	25	3	
(3) Not defined as acute or chronic ..	4	65	..	69	..	
107. Broncho-pneumonia ..	10	367	241	377	10	
108. Lobar-pneumonia ..	7	399	54	406	9	
109. Pneumonia (not otherwise defined)	5	102	15	107	5	
110. Pleurisy:—						
(1) Empyema ..	7	42	7	49	4	
(2) Other pleurisy ..	8	98	4	106	10	
111. Congestion and hæmorrhagic infarction of lung, etc:—						
(1) Hypostatic congestion of lung ..	..	3	3	3	..	
(2) Massive collapse ..	..	2	1	2	..	
(3) Pulmonary embolism	..	3	3	3	..	
(4) Others ..	..	2	..	2	2	
112. Asthma	4	185	2	189	8	
113. Pulmonary emphysema ..	1	12	2	13	3	
Carried forward ..	1,042	12,951	1,755	13,993	1,537	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	Yearly Total		†Total cases treated	‡Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	1,042	12,951	1,755	13,993	1,537	
VIII.—*Diseases of the Respiratory System*—(contd.)						
114. Other diseases of the respiratory system:—						
(1) Chronic interstitial pneumonia (including occupational diseases of the lung) ..	..	3	..	3	..	
(2) Gangrene of the lung	..	6	..	6	..	
(3) Abscess of the lung	2	20	7	22	..	
(4) Bronchiectasis ..	..	25	7	25	2	
(5) Others ..	..	7	..	7	1	
IX.—*Diseases of the Digestive System*						
115. Diseases of the buccal cavity, pharynx, etc.:—						
(1) Pyorrhœa and Gingivitis ..	3	75	..	78	2	
(2) Dental caries ..	..	40	..	40	..	
(3) Stomatitis ..	..	8	..	8	..	
(4) Vincent's or Ludwig's Angina ..	..	22	..	22	1	
(5) Diseases of the tonsils	4	407	..	411	10	
(6) Others, including coryza, acute nasopharyngitis, etc...	..	237	..	237	1	
116. Diseases of the œsophagus ..	..	39	1	39	1	
117. Ulcer of the stomach or duodenum:—						
(1) Ulcer of the stomach	4	113	18	117	6	
(2) Ulcer of the duodenum ..	1	58	1	59	4	
118. Other diseases of the stomach:—						
(1) Gastritis ..	1	165	..	166	10	
(2) Others, *e.g.* indigestion	1	102	6	103	3	
119. Diarrhœa and enteritis (under 2 years) ..	4	473	190	477	9	
Carried forward ..	1,062	14,751	1,985	15,813	1,587	

APPENDIX *X—continued*

Return of Diseases and Deaths for the Year 1947—*continued*

Diseases	*Remaining at end of 1946	Yearly Total		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	1,062	14,751	1,985	15,813	1,587	
IX.—*Diseases of the Digestive System*—(contd.)						
120. Diarrhœa and enteritis:—(2 years and over)						
(1) Colitis	2	61	1	63	1	
(2) Otherwise defined, including gastro-enteritis ..	2	199	7	201	3	
121. Appendicitis	6	378	9	384	7	
122. Hernia, Intestinal obstruction:—						
(1) Hernia ..	5	271	1	276	20	
(2) Strangulated hernia	2	56	7	58	1	
(3) Intestinal obstruction .. .. (including intussusception)	2	31	18	33	1	
123. Other diseases of the intestines:—						
(1) Constipation, intestinal stasis ..	..	43	..	43	..	
(2) Diseases of Rectum or Anus ..	4	22	..	26	4	
(3) Others, *e.g.*, intestinal colic ..	5	192	1	197	4	
124. Cirrhosis of liver (non-syphilitic):—						
(1) Alcoholic ..	..	2	1	2	..	
(2) Not returned as alcoholic ..	1	40	11	41	5	
125. Other diseases of the liver:—						
(1) Acute yellow atrophy	..	8	2	8	..	
(2) Toxic hepatitis ..	3	58	5	61	2	
(3) Amœbic abscess and hepatitis ..	5	87	10	92	1	
(4) Others ..	..	8	3	8	..	
126. Biliary calculi or Biliary colic	1	21	4	22	1	
127. Other diseases of the gall bladder and ducts:—						
(1) Cholecystitis without record of calculi ..	..	34	3	34	..	
(2) Others, *e.g.*, catarrhal jaundice ..	..	36	4	36	2	
Carried forward ..	1,100	16,298	2,093	17,398	1,639	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	**1,100**	**16,298**	**2,093**	**17,398**	**1,639**	
IX.—*Diseases of the Digestive System*—(contd.)						
128. Diseases of the pancreas (excluding diabetes mellitus) ..	..	2	1	2	..	
129. Peritonitis, without stated cause:—						
(1) Acute	3	18	9	21	2	
(2) Chronic ..	1	15	1	16	..	
X.—*Diseases of the Genito-Urinary System (non-venereal)*						
130. Acute nephritis.. ..	8	56	11	64	..	
131. Chronic nephritis ..	1	47	17	48	1	
132. Nephritis (undefined as acute or chronic)	3	44	10	47	11	
133. Other diseases of the kidney and annexa:—						
(1) Pyelitis ..	..	72	5	72	2	
(2) Others ..	..	23	13	23	..	
134. Calculi of the urinary passages:—						
(1) Calculi of the kidney and ureter, or renal colic ..	2	85	1	87	3	
(2) Calculi of the bladder or urethra ..	3	36	1	39	..	
(3) Calculi of unstated site	..	1	..	1	..	
135. Diseases of the Bladder:—						
(1) Cystitis ..	..	44	1	44	1	
(2) Others ..	1	10	1	11	1	
136. Diseases of the urethra:—						
(1) Stricture ..	3	48	..	51	..	
(2) Others ..	..	32	1	32	1	
137. Diseases of the prostate ..	1	30	..	31	4	
138. Diseases of the male genital organs:—						
(1) Epididymitis ..	..	10	..	10	..	
(2) Orchitis ..	..	35	..	35	1	
(3) Hydrocele ..	7	149	..	156	7	
(4) Others, *e.g.*, phimosis	1	75	1	76	4	
Carried forward ..	1,134	17,131	2,166	18,264	1,677	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward . .	1,134	17,131	2,166	18,264	1,677	
X.—*Diseases of the Genito-Urinary System (non-venereal)*—(contd.)						
139. Diseases of the female genital organs:—						
(1) Diseases of the ovary	4	65	1	69	1	
(2) Diseases of the fallopian tube . .	7	99	3	106	3	
(3) Diseases of the parametrium . .	1	12	1	13	. .	
(4) Diseases of the uterus, including menorrhagia and dysmenorrhœa . .	9	245	2	254	7	
(5) Diseases of the breast	2	37	. .	39	1	
(6) Other diseases of the female genital organs, *e.g.*, prolapse . .	15	139	5	154	. .	
XI.—*Conditions arising in Pregnancy, Childbirth and the Puerperal State*						
140. Post abortive sepsis . .	4	22	. .	26	1	
141. Abortion not returned as septic	6	203	1	209	. .	
142. Ectopic gestation . .	1	54	7	55	4	
143. Other accidents of pregnancy	. .	123	6	123	. .	
144. Hæmorrhage connected with childbirth:—						
(1) Placenta prævia . .	2	62	4	64	1	
(2) Others . .	8	60	11	68	. .	
145. Puerperal sepsis:—						
(1) Puerperal septicæmia	1	12	1	13	. .	
(2) Puerperal sepsis, not including septicæmia	7	26	10	33	. .	
146. Abuminuria and convulsions connected with pregnant state:—						
(1) Ante-partum eclampsia . .	2	47	9	49	1	
(2) Intra-partum eclampsia . .	. .	. .	. .	. .	. .	
(3) Post-partum eclampsia . .	. .	. .	. .	. .	. .	
Carried forward . .	1,203	18,337	2,227	19,540	1,696	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	Yearly Total		†Total cases treated	‡Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward . .	1,203	18,337	2,227	19,540	1,696	
XI.—*Conditions arising in Pregnancy, Childbirth and the Puerperal State*—(contd.)						
146. *Abuminuria and convulsions connected with pregnant state:*—(contd.)						
(4) Albuminuria of pregnancy . .	14	7	. .	21	. .	
(5) Pyelitis of pregnancy	1	5	1	6	. .	
(6) Otherwise defined . .	. .	2	2	2	. .	
147. Other Toxæmias of pregnancy:—						
(1) Hyperemesis gravidarum . .	. .	12	. .	12	. .	
(2) Others . .	. .	4	2	4	. .	
148. Puerperal phlegmasia or embolism:—						
(1) Puerperal phlegmasia	. .	2	. .	2	. .	
(2) Puerperal embolism	. .	. .	. .	. .	. .	
149. Conditions associated with Labour:—						
(1) Normal labour . .	152	6,261	. .	6,413	160	
(2) Abnormal labour, *e.g* needing instrumental interference . .	13	1,541	. .	1,554	16	
(3) Labour complicated with intercurrent disease . .	84	. .	. .	84	. .	
(4) Accidents of childbirth . .	19	1	1	20	. .	
150. Other or unspecified conditions of the puerperal state:—						
(1) Puerperal insanity . .	. .	3	. .	3	. .	
(2) Puerperal disease of the breast . .	. .	2	. .	2	. .	
(3) Others . .	. .	2	. .	2	. .	
XII.—*Diseases of the Skin and Cellular Tissues*						
151. Carbuncle, boil . .	. .	110	1	110	4	
152. Cellulitis, or abscess (except due to cause given elsewhere)	23	686	21	709	33	
Carried forward . .	1,509	26,975	2,255	28,481	1,809	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	1,509	26,975	2,255	28,481	1,809	
XII.—*Diseases of the Skin and Cellular Tissues*—(contd.)						
153. Other diseases of the skin, hair and nails:—						
(1) Uclers	43	310	6	353	24	
(2) Dermal mycoses ..	..	3	..	3	..	
(3) Herpes, including Zoster ..	1	14	..	15	1	
(4) Scabies ..	1	147	..	148	13	
(5) Others ..	9	642	1	652	15	
XIII.—*Diseases of the Bones and Organs of Locomotion*						
154. Acute or chronic infective osteomyelitis and periostitis, except due to cause given elsewhere ..	4	95	1	99	5	
155. Other diseases of the bones ..	..	23	1	23	8	
156. Diseases of the joints and other organs of locomotion:—						
(1) Diseases of the joints (other than stated elsewhere) ..	2	35	2	37	..	
(2) Diseases of the other organs of locomotion ..	2	25	..	27	3	
XIV.—*Congenital Malformations*						
157. Congenital malformations:—						
(1) Congenital hydrocephalus ..	..	4	..	4	1	
(2) Spina bifida and meningocele ..	1	..	..	1	..	
(3) Congenital malformation of the heart	..	13	4	13	..	
(4) Monstrosities ..	..	24	..	24	1	
(5) Congenital hypertrophic pyloric stenosis ..	..	..	..	..	..	
(6) Cleft palate, harelip	..	57	..	57	2	
(7) Imperforate anus ..	..	6	4	6	..	
(8) Other congenital malformations ..	1	17	2	18	..	
Carried forward ..	1,573	28,390	2,276	29,963	1,882	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	1,573	28,390	2,276	29,963	1,882	
XV.—*Diseases of early Infancy*						
158. Congenital debility, including marasmus of unknown cause	..	14	10	14	2	
159. Premature birth ..	..	566	17	566	..	
160. Injury at birth ..	..	2	..	2	..	
161. Other diseases peculiar to early infancy:—						
(1) Atelectasis pulmonum ..	..	12	2	12	1	
(2) Icterus neonatorum						
(*a*) Mild ..	..	..	..	..	..	
(*b*) Grave ..	..	2	2	2	..	
(3) Affections of the umbilicus ..	..	7	1	7	..	
(4) Pemphigus neonatorum ..	..	..	..	..	..	
(5) Others ..	2	2	..	4	..	
XVI.—*Conditions Associated with Old Age*						
162.—(1) Senile dementia ..	..	1	..	1	..	
(2) Other forms of senile decay		16	8	16	5	
XVII.—*Affections Produced by External Causes*						
163. Suicide, or attempted suicide, by poisoning.. .. (including corrosive poisoning)	..	72	22	72	1	
164. Suicide, or attempted suicide, by gas poisoning ..	..	..	..	..	..	
165. Suicide, or attempted suicide, by hanging or strangulation	..	5	1	5	..	
166. Suicide, or attempted suicide, by drowning ..	..	12	1	12	1	
167. Suicide, or attempted suicide, by firearms	..	..	..	..	..	
168. Suicide, or attempted suicide, by cutting or piercing instruments	..	28	2	28	1	
Carried forward ..	1,575	29,129	2,342	30,704	1,893	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	†Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward . .	1,575	29,129	2,342	30,704	1,893	
XVII.—*Affections Produced by External Causes*—(contd.)						
169. Suicide, or attempted suicide, by jumping from a height	. .	1	. .	1	. .	
170. Suicide, or attempted suicide, by crushing	. .	. .	. .	. .	. .	
171. Suicide, or attempted suicide, by other means . .	. .	1	. .	1	. .	
172. Infanticide	. .	. .	. .	. .	. .	
173. Assault or homicide, by fire-arms	5	101	20	106	4	
174. Assault or homicide, by cutting or piercing instruments	3	135	4	138	3	
175. Assault or homicide, by other means	7	343	6	350	6	
176. Attacks by venomous animals:—						
(1) Snake bite . .	. .	6	. .	6	. .	
(2) Insect bite . .	. .	4	. .	4	. .	
(3) Others . .	. .	21	. .	21	. .	
177. Food poisoning . .	. .	8	. .	8	. .	
178. Accidental absorption of irrespirable or poisonous gas	. .	8	1	8	. .	
179. Other acute accidental poisoning	2	28	. .	30	. .	
180. Injuries due to conflagration						
181. Accidental burns:— (Conflagration excepted)						
(1) Burns by fire . .	13	272	22	285	3	
(2) Scalds	3	140	3	143	9	
(3) Burns by corrosive substances, external or internal . .	. .	26	. .	26	. .	
(4) Dermatitis due to exposure to sun . .	. .	6	. .	6	. .	
(5) Dermatitis due to exposure to other forms of radiation	. .	5	. .	5	. .	
182. Accidental mechanical suffocation	. .	1	1	1	. .	
183. Accidental immersion or drowning	. .	2	. .	2	. .	
184. Accidental injury by firearms	. .	24	1	24	. .	
185. Accidental injury by cutting or piercing instruments . .	12	129	. .	141	3	
186. Accidental injury by fall, crushing, etc:—						
(1) By fall . .	43	800	38	843	38	
(2) By machinery . .	1	59	. .	60	1	
Carried forward . .	1,664	31,249	2,438	32,913	1,950	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Diseases	*Remaining at end of 1946	YEARLY TOTAL		†Total cases treated	‡Remaining at end of 1947	Remarks
		Admissions	Deaths			
Brought forward ..	1,664	31,249	2,438	32,913	1,950	
XVII.—*Affections Produced by External Causes*—(contd.)						
186. *Accidental injury by fall, crushing, etc.*:—(contd.)						
(3) By motor vehicles ..	52	830	64	882	21	
(4) By railway vehicles	..	1	..	1	..	
(5) By other means ..	19	817	24	836	37	
187. Cataclysm:— (tidal waves, cyclones, etc.)						
188. Injury by animals (except bites or stings of venomous reptiles or insects) ..	..	15	..	15	..	
189. Hunger or thirst ..	..	..	..	..	..	
190. Excessive cold ..	..	..	..	..	..	
191. Excessive heat	..	3	..	3	..	
192. Lightning	..	..	..	..	..	
193. Electricity	..	4	..	4	..	
194. Other unstated forms of violence:—						
(1) Inattention at birth	..	..	..	..	..	
(2) Others, *e.g.*, foreign body swallowed ..	..	51	1	51	2	
195. Violence of an unstated nature (*i.e.* suicidal, homicidal, or accidental, by poisoning or any other means)	2	89	..	91	..	
196. Wounds or other injuries of War	1	1	..	2	..	
197. Execution of civilians by belligerent armies ..	..	..	..	..	..	
198. Execution	..	..	..	..	..	
XVIII.—*Ill-defined Conditions*						
199. Sudden illness (cause unknown)	..	9	..	9	..	
200. Cause of illness unstated or ill-defined	34	668	50	702	52	
201. Diseases not included in this classification elsewhere which have caused no deaths	..	40	..	40	1	
202. Malingering	..	2	..	2	..	
203. Cases admitted to hospital for observation as to mental condition	..	12	..	12	..	
204. Cases admitted for observation .. .. (not mental)	3	169	..	172	6	
Total ..	1,775	33,960	2,577	35,735	2,069	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1947—*continued*

Nationalities	Remaining in hospital at end of 1946	Yearly Total		Total cases treated	Remaining in hospital at end of 1947	Remarks
		Admissions	Deaths			
Europeans	35	1,373	20	1,408	42	
Eurasians	26	720	36	746	39	
Chinese	1,285	23,513	2,168	24,860	1,520	
Indians	354	6,039	278	6,331	353	
Malays	53	1,771	56	1,824	89	
Javanese	8	179	13	187	10	
Japanese	4	273	2	277	6	
Others	10	92	4	102	10	
TOTAL ..	1,775	33,960	2,577	35,735	2,069	

APPENDIX *XI*

Types of malaria seen in the General Hospital during the year 1947:—

Type	*Admissions*	*Deaths*
Subtertian	216	34
Tertian	85	—
Quartan	1	—
Mixed	5	—
TOTAL ..	307	34

Terminal causes of death in malaria:—

Cause	*Number*
Cardiac Failure	11
Cerebral malaria	16
Malaria with pneumonia	2
Malaria with ankylostomiasis	1
Malaria with Beri-beri	1
Malaria with dysentery	1
Malaria with secondary anæmia	2

APPENDIX *XII*

TABULATED STATEMENT: BLOOD TRANSFUSION SERVICE

DONORS AND RECIPIENTS CLASSIFIED BY RACE

Race	*Total Number*	*Blood Groups*				*Recipients*
		O	*A*	*B*	*A B*	
European ..	754	423	214	99	18	18
Chinese ..	146	71	29	41	5	502
Indians ..	47	21	12	12	2	152
Malays ..	18	6	5	7	—	19
Eurasians ..	31	17	3	8	3	11
Others ..	—	—	—	—	—	23
	996	538	263	167	28	725

Of the European donors 227 were civilian and 527 Army personnel. Of the other 242 donors 120 were relatives of recipients.

Total number of donors in 1946 = 287.

In addition about 600 bottles of dried blood plasma were issued during the year. In this respect it has to be noted that the supply of imported dried blood plasma is very strictly limited.

APPENDIX *XIII*

Table showing causes of deaths of inpatients in the General Hospital for the years 1946 and 1947:—

Causes of Death	1946 (June/December)		1947	
	Admissions	Deaths	Admissions	Deaths
Enteric Group	27	8	70	14
Typhus	21	..	21	1
Malaria	240	31	473	36
Diphtheria	10	2	1	..
Influenza	33	1	50	4
Dysentery, Diarrhoea and Enteritis ..	228	73	637	210
Tuberculosis of Respiratory System ..	203	32	350	82
Other Tuberculous Disease	149	77	239	120
Malignant Disease	175	28	388	66
Beri-beri	19	11	19	9
Diabetes	23	2	59	5
Cerebral Haemorrhage	45	18	87	35
Bronchitis	65	1	108	..
Pneumonia (all forms)	372	105	770	292
Other Respiratory Disease	155	16	335	22
Ulcer-Gastric, Duodenal, etc. ..	45	5	147	17
Ankylostomiasis	43	2	63	..
Other Intestinal Parasites	41	1	99	11
Appendicitis	155	10	355	7
Cirrhosis of Liver	18	4	33	8
Nephritis (all forms)	68	16	111	32
Venereal Disease	74	13	185	26
Congenital Debility, Malformations, premature birth, etc.	14	12	54	30
Suicide	66	18	110	25
Other forms of Violence	1,758	134	3,330	182
Other Disease	2,775	235	6,481	467
TOTAL ..	6,827	855	14,579	1,701

APPENDIX *XIV*

The following is a summary of the examinations carried out by the clinical laboratories of all hospitals, Singapore, during the year 1947:—

Physiological examination of Blood	29,911
Biochemical examination of Blood and Urine . .	919
Examination of Cerebro-spinal Fluid . .	1,399
Examination of Cisternal, Pleural and Other Fluids	286
Examination of Gastric Contents	1,765
Examination of Smears	1,667
Examination of Urine, including microscopic . .	26,125
Examination of Fæces	3,460
Examination of Sputa	19,970
Total examinations . .	85,502

APPENDIX *XV*

OUTPATIENTS

Total attendances at Outpatient Clinics at all hospitals during the year 1947 were distributed as follows:—

Hospital	New Cases	Repetitions	Total Attendances
General	40,496	73,671	114,167
Kandang Kerbau (Maternity) . .	28,709	51,333	80,042
Tan Tock Seng (General and Tuberculosis)	6,860	12,858	19,718
Social Hygiene	9,055	35,935	44,990
Bukit Timah O.D.D.	7,273	10,243	17,516
Paya Lebar O.D.D.	4,615	11,345	15,960
Police O.D.D.	4,406	7,515	11,921
Police Clinic	5,905	11,810	17,715
Changi Prison O.P.D.	2,492	4,523	7,015
Outram Road Gaol O.P.D. . .	66,856	134,216	201,072
Total . .	176,667	353,449	530,116

N.B.—Total for 7 months in 1946 = 164,688.

APPENDIX *XVI*

The following is a summary of the examinations carried out by the Department of Pathology during the year 1947:—

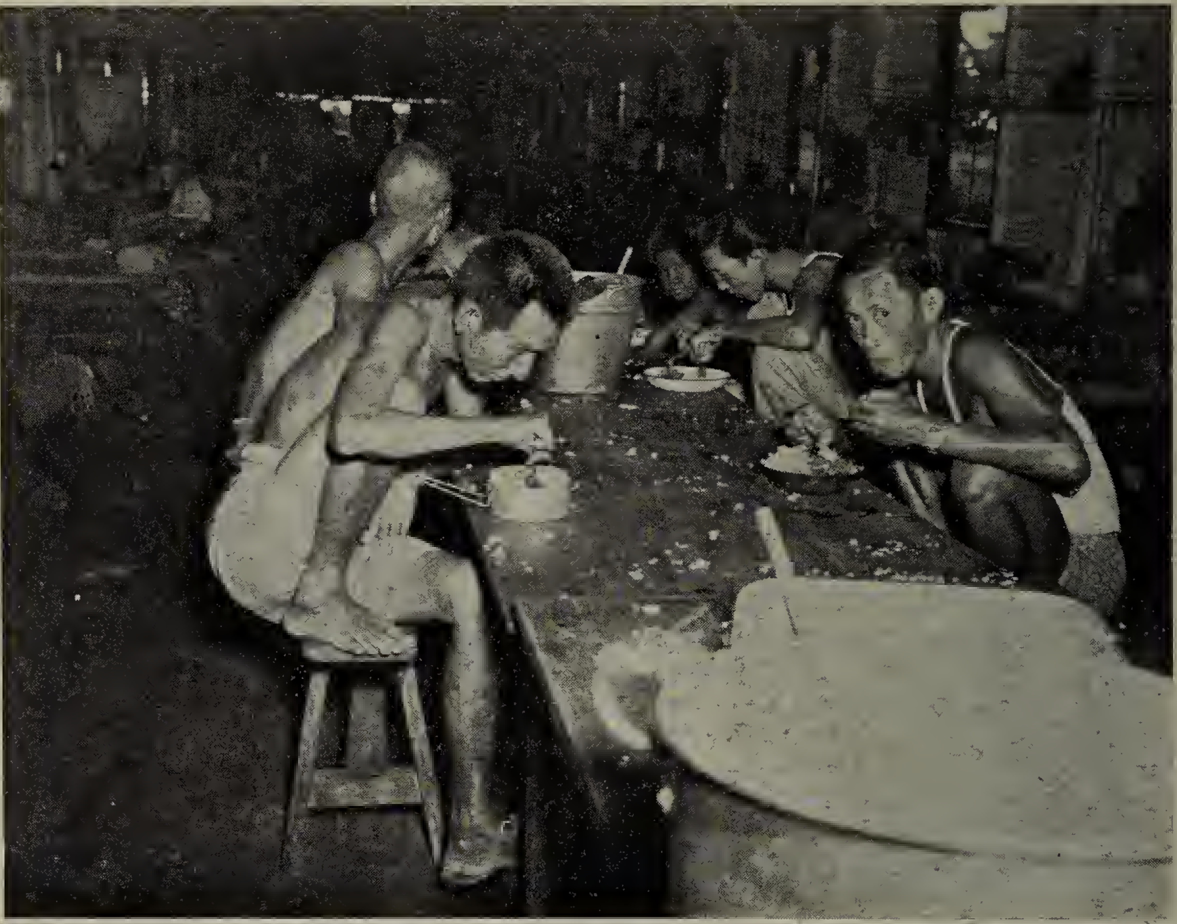
Autopsies	1,047
Histological Sections	1,860
Serological Tests (blood)	20,404
Serological Tests (C.S.F.)	466
Bacteriological Investigations	5,224
Medico-Legal Examinations	114
Blood Donors (Europeans 754)	996

PHOTOGRAPHS DEPICTING THE WORK CARRIED OUT BY THE HOSPITALS DIVISION

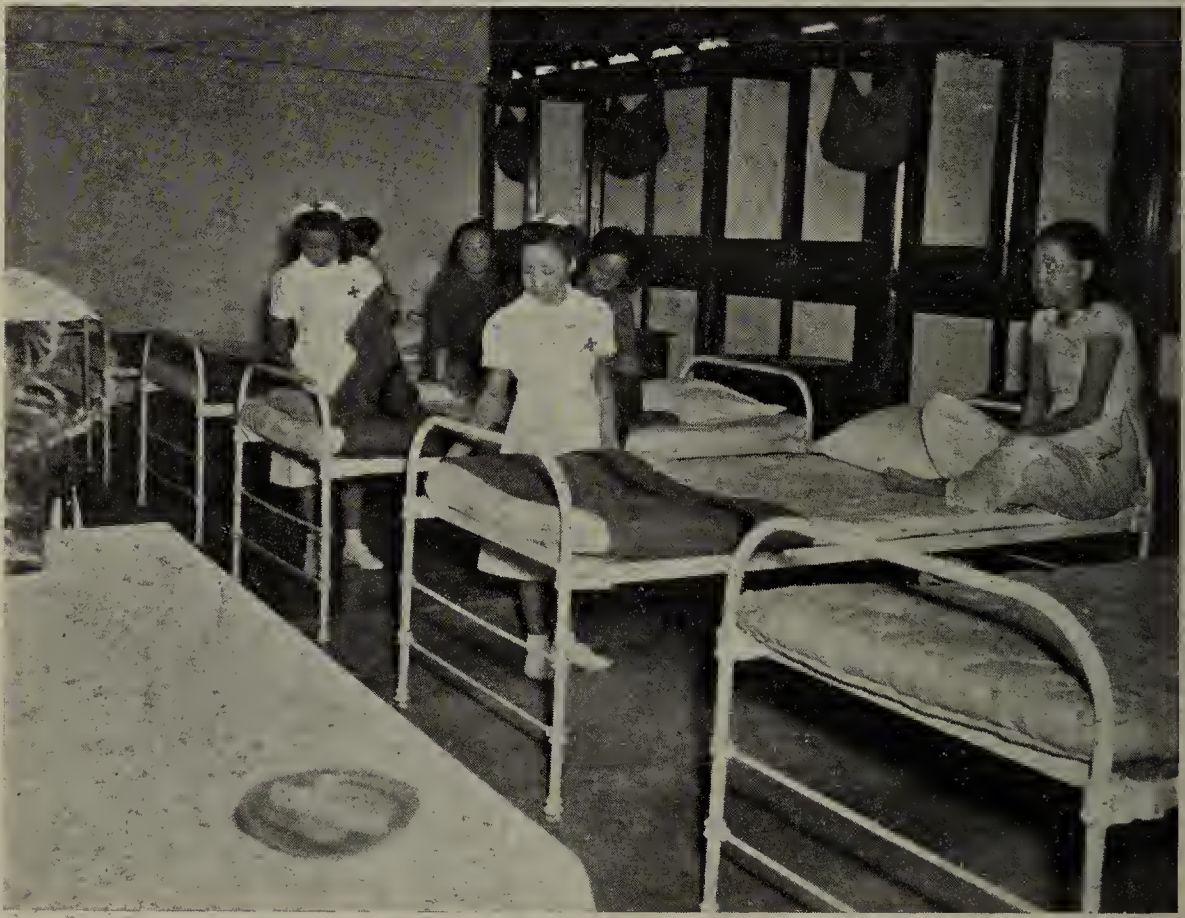
(The assistance and co-operation of the Public Relations Secretary and his staff in the production of these photographs are gratefully acknowledged)

Leper children at school in the Leper Settlement

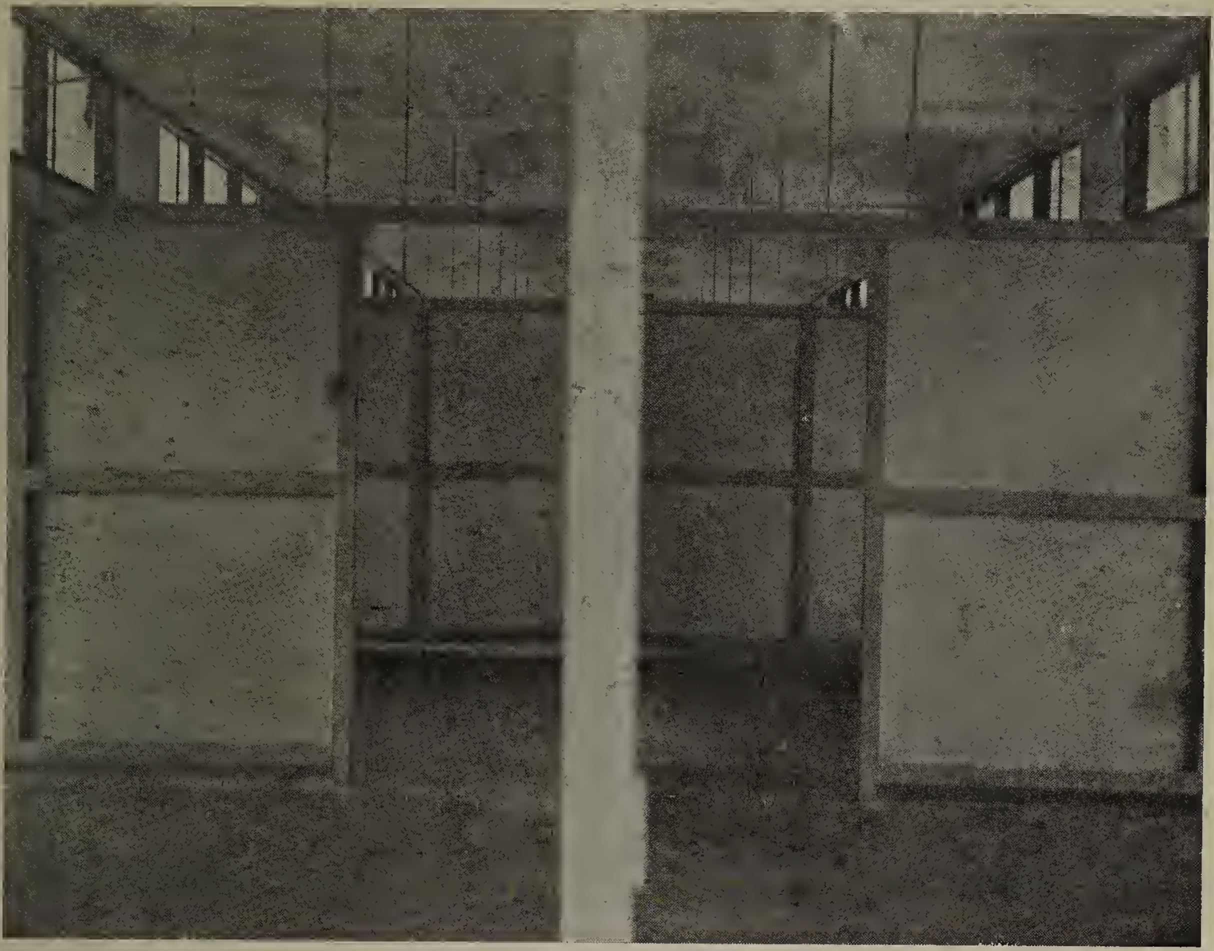
Surgical Tuberculosis—Orthopædic Hospital, Siglap



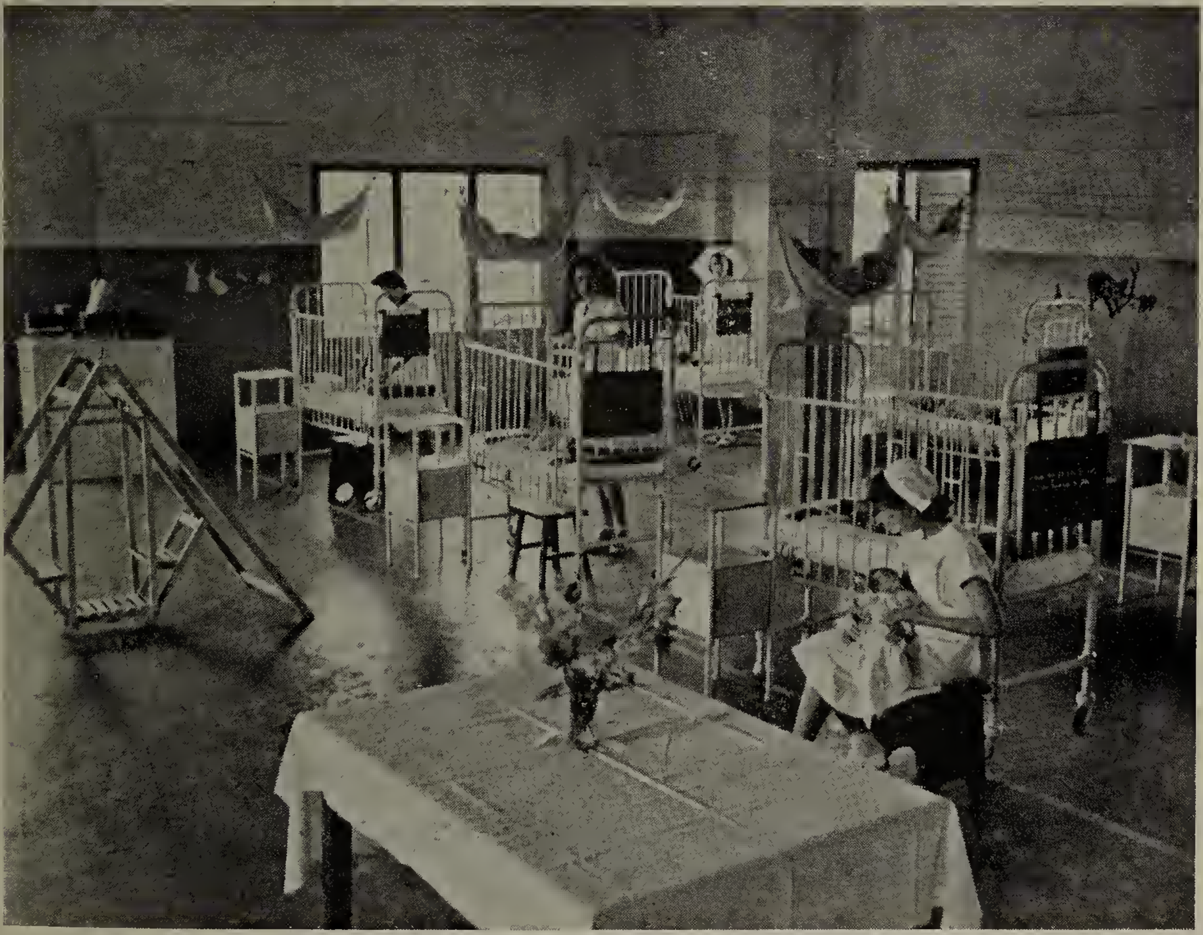
Overcrowding in the male section of the Leper Settlement



One of the new units in the female section of the Leper Settlement, with leper patients as nurses



A ward in the General Hospital after the Japanese Occupation



Children's Ward, General Hospital

A Staff Nurse's bedroom with adjoining verandah alcove

At the General Hospital—Nurses off duty

One day's delivery at Kandang Kerbau Hospital

Surgical Physiotherapy

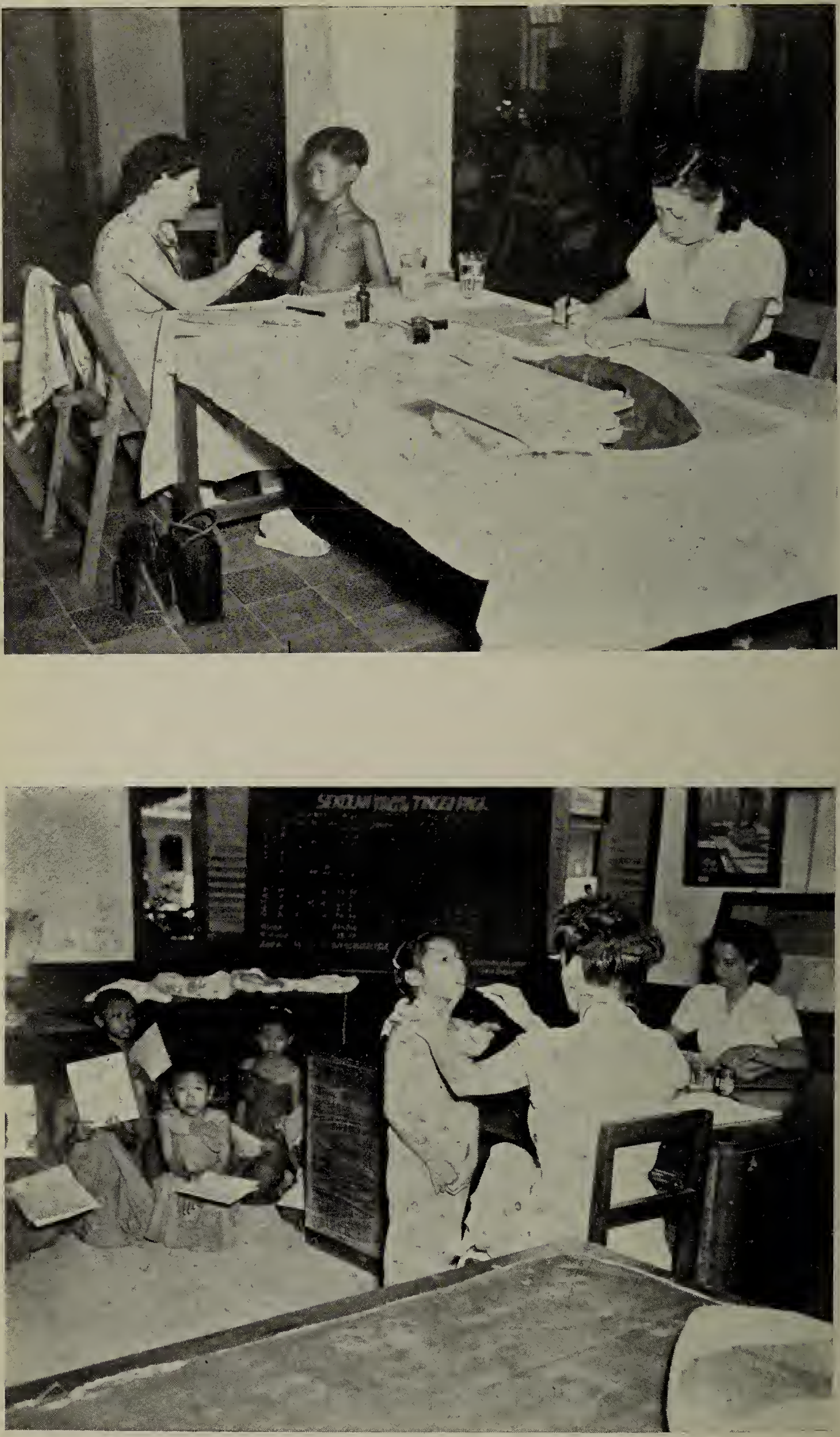
Nurses and Hospital Assistants receive their Certificates from Lady Gimson

Post-natal Clinic—Kandang Kerbau Hospital

Outpatients Department—Social Hygiene Hospital

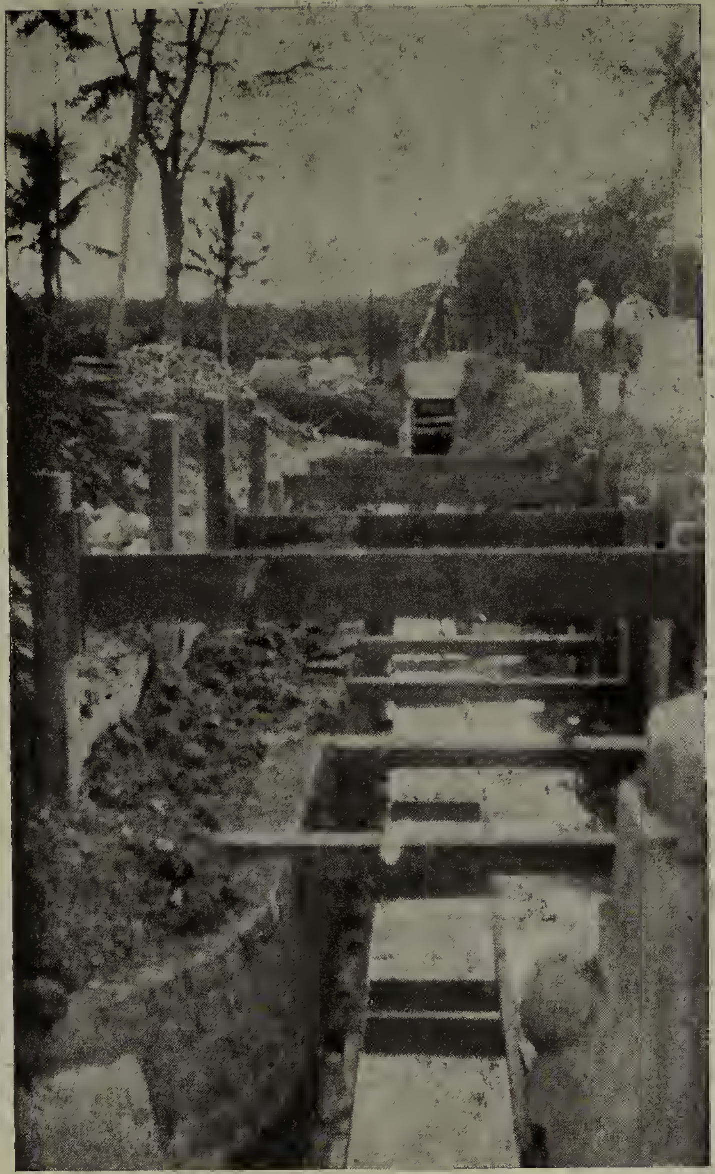
PHOTOGRAPHS DEPICTING THE WORK CARRIED OUT BY THE HEALTH DIVISION

School children awaiting medical examination

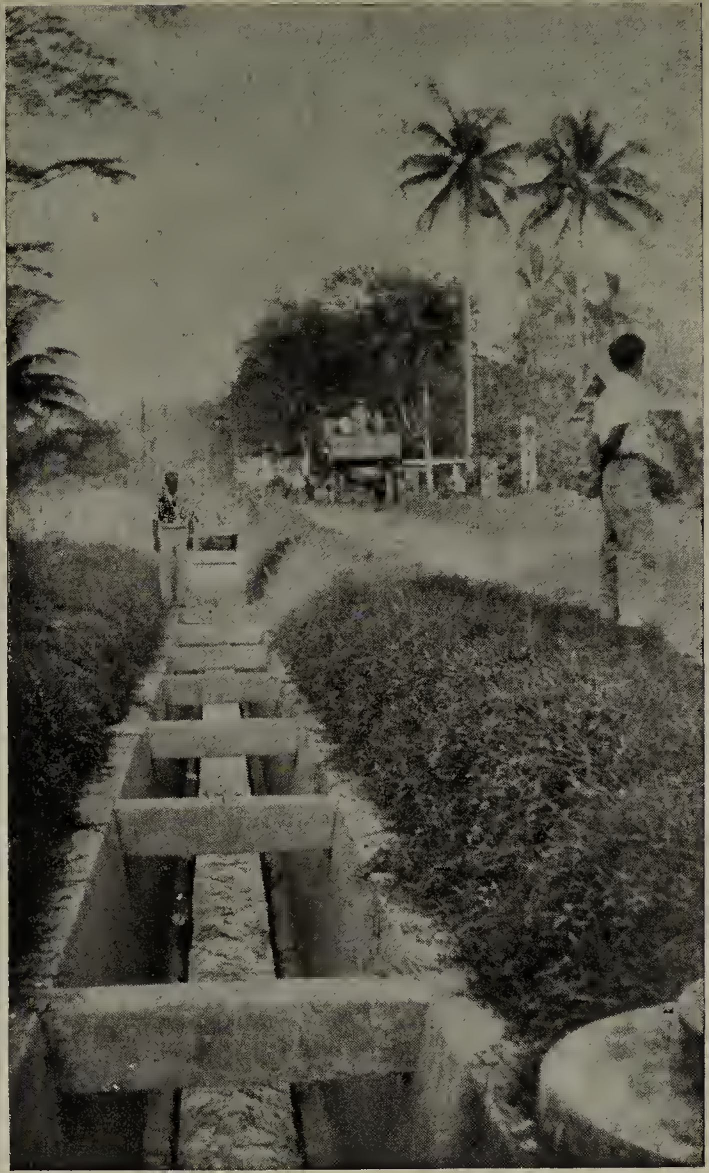


Medical examinations in progress

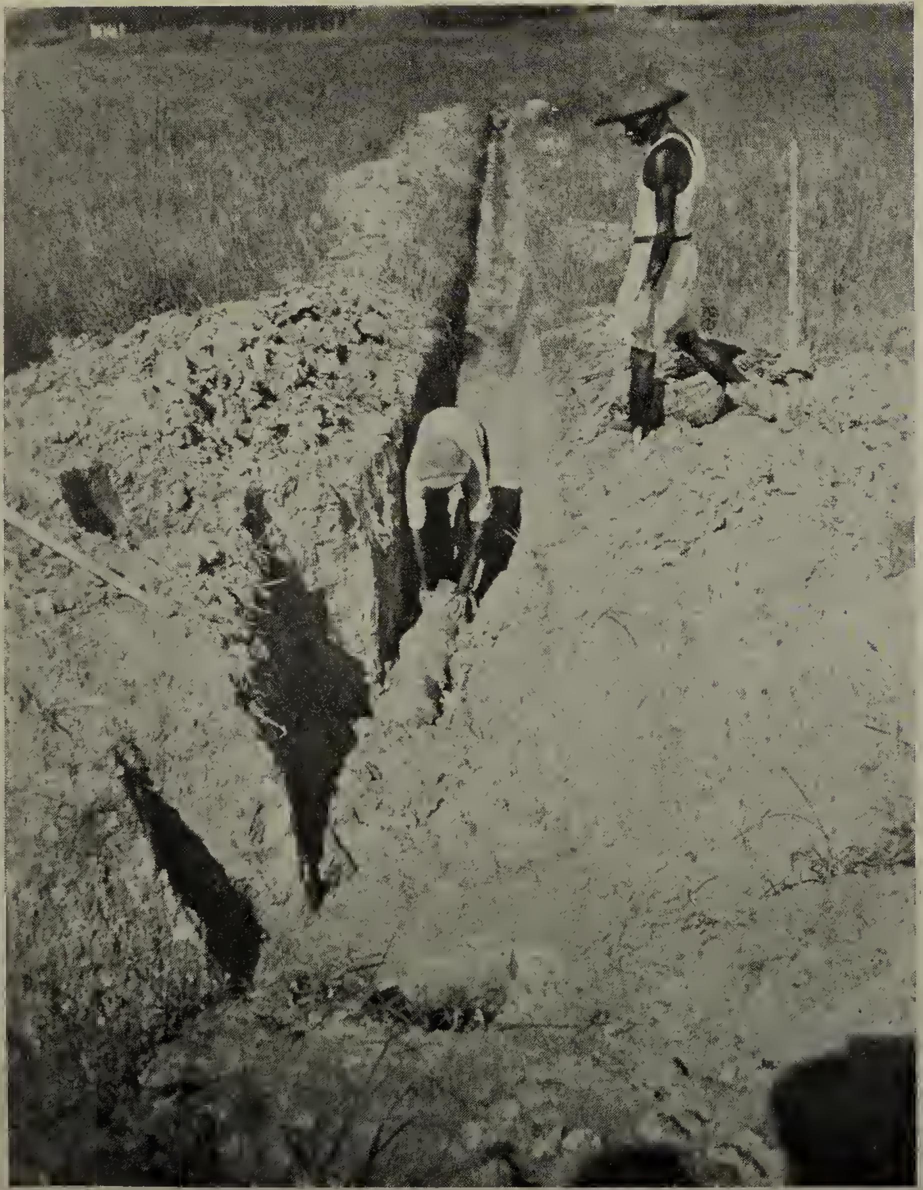
Typical Anti-malarial work.



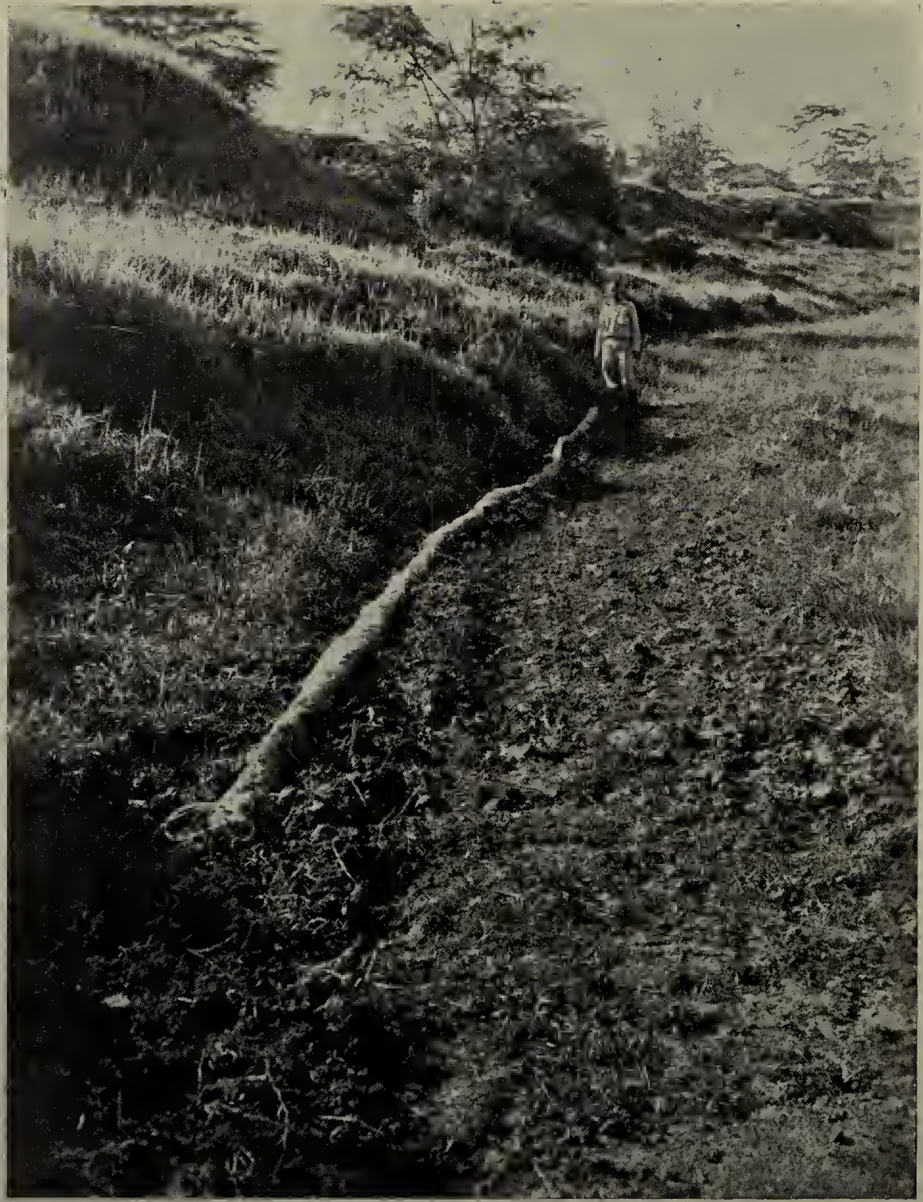
Chua Chu Kang Road drain in construction



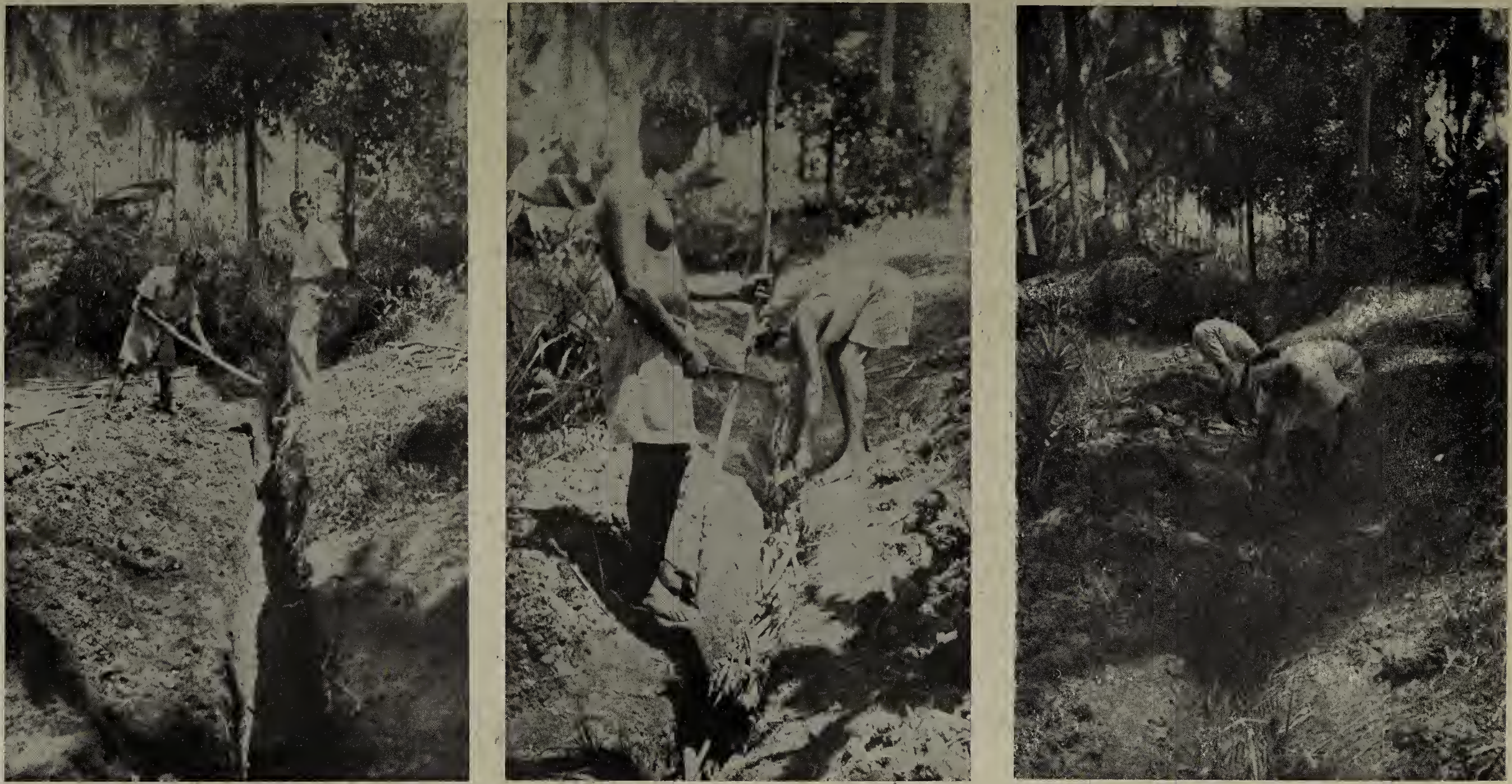
Chua Chu Kang Road drain—completed



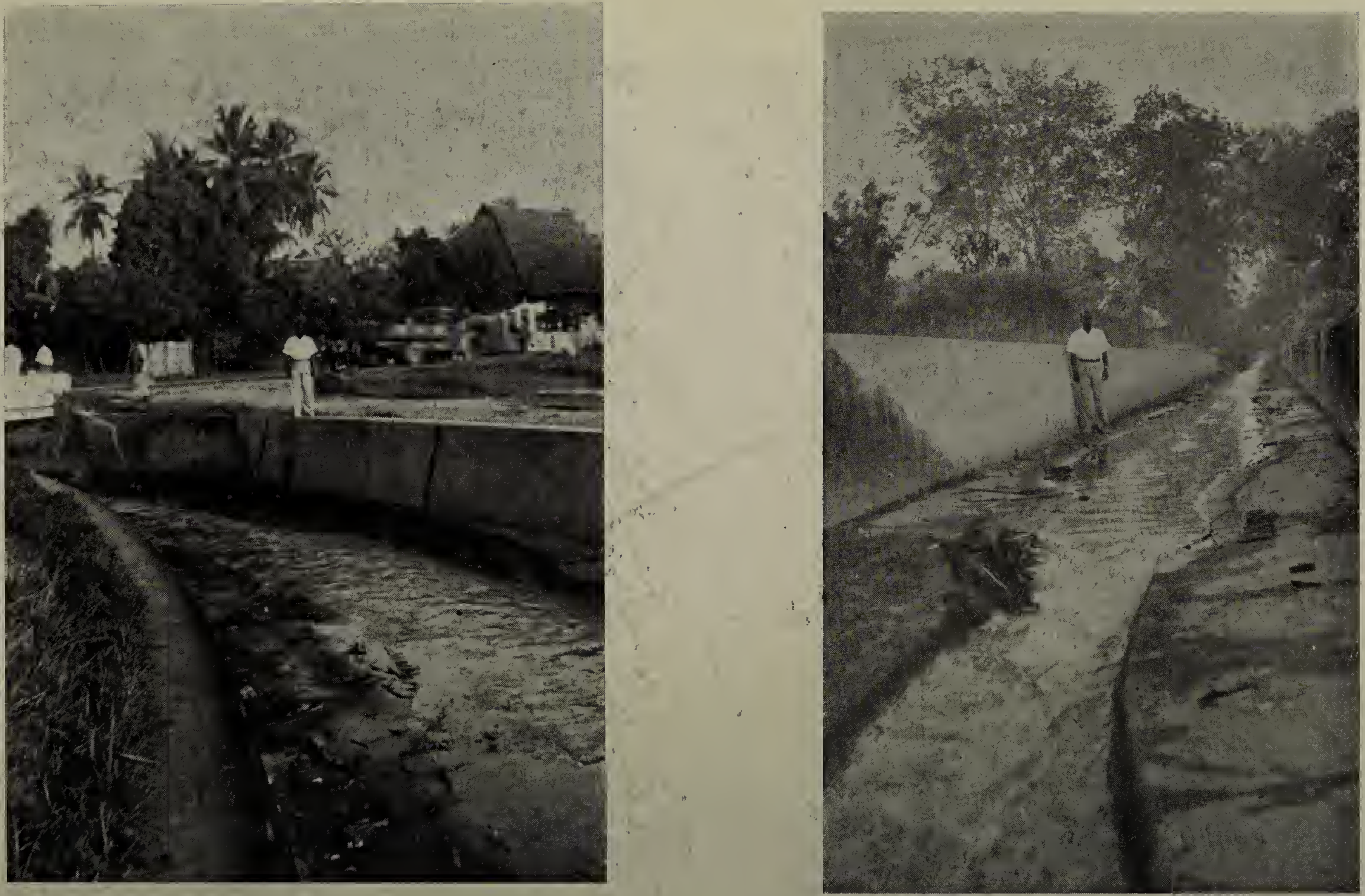
Covering top of subsoil to prevent silting



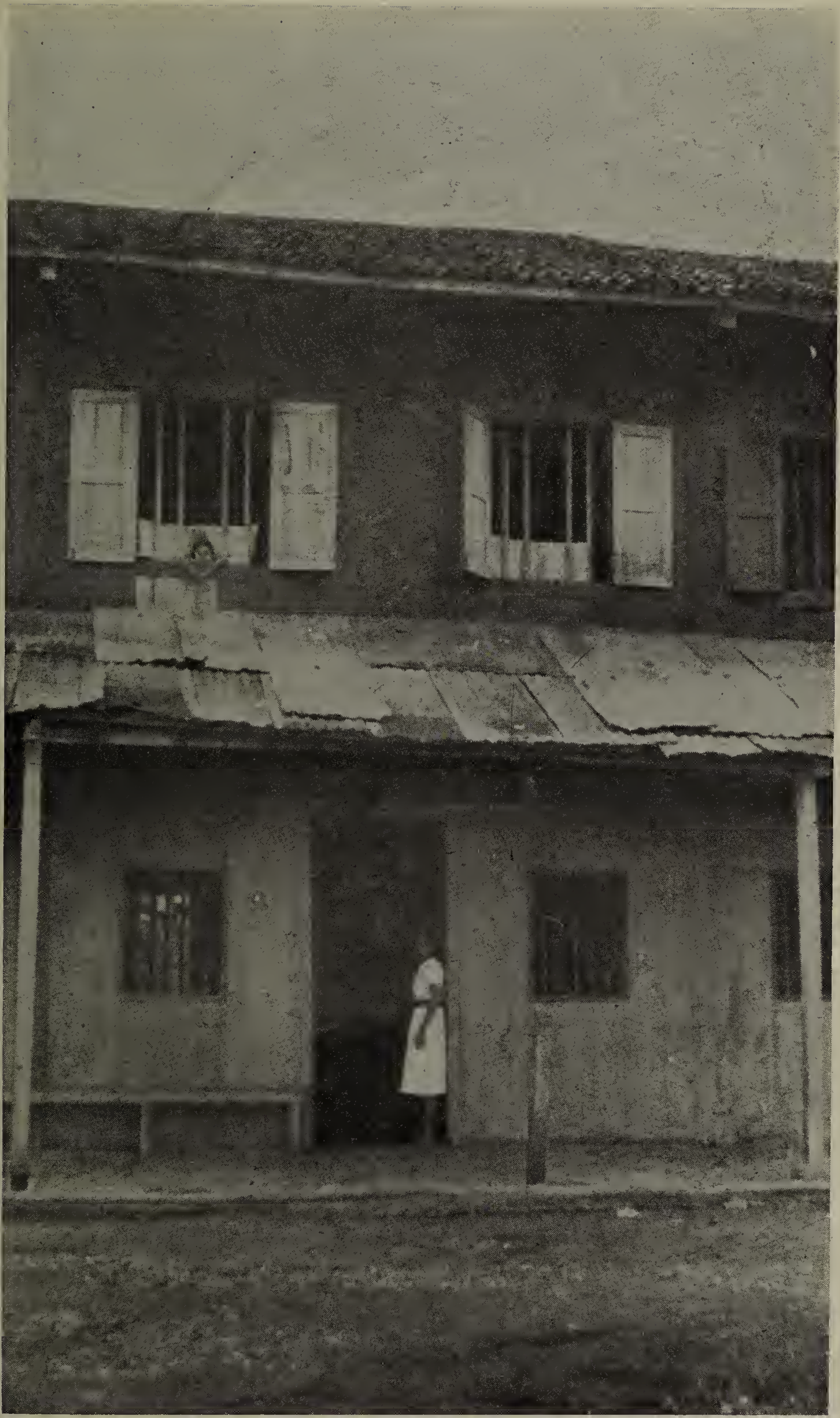
Root blockage removed from subsoil pipe



Stick drain in course of construction in Bukit Timah



Main Anti-malarial drain (Bukit Panjang) rehabilitated

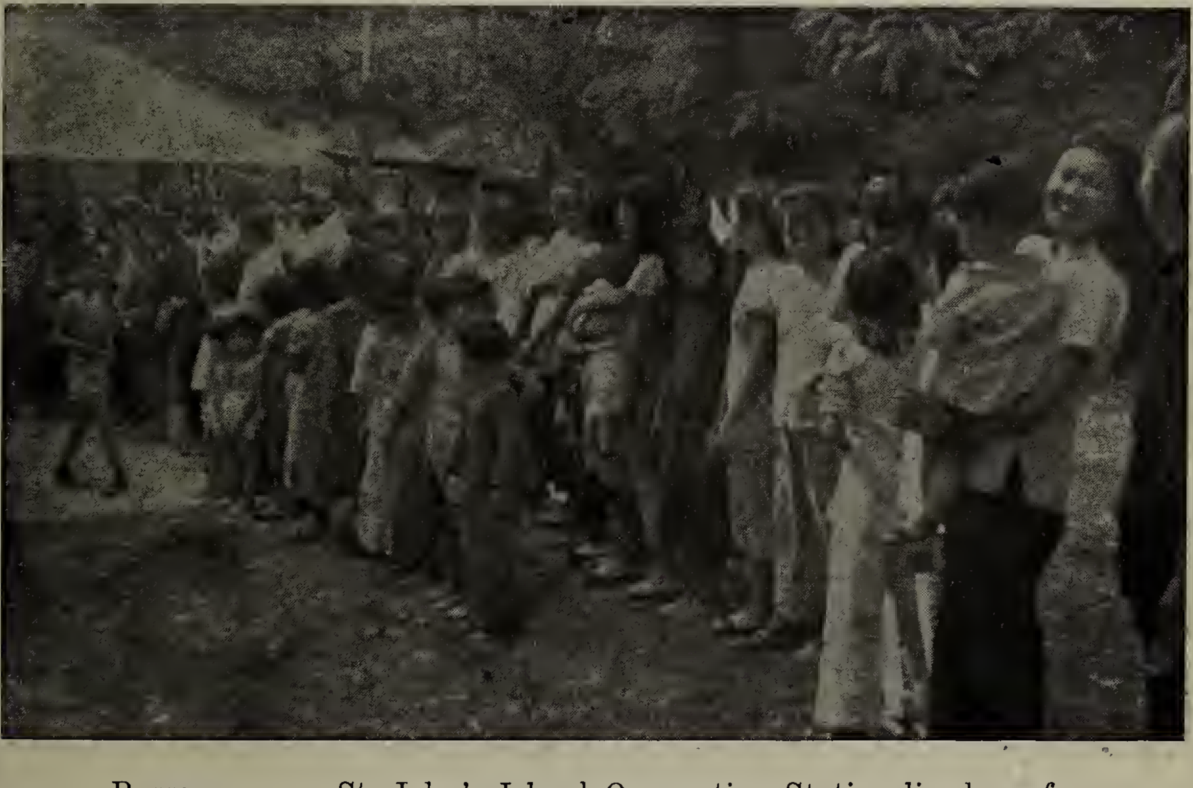


A typical temporary Maternity and Child Welfare Centre
(Bukit Panjang Village)

One of the more up-to-date Maternity and Child Welfare Centres available (Bukit Timah)

A Maternity and Child Welfare Centre put up by local effort (Jurong)

Passengers arriving at St. John's Island Quarantine Station



Passengers on St. John's Island Quarantine Station lined up for Medical Inspection

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